UNITED STATES ARMY

DECEMBER 1987

# AVIATION DIGEST

Professional Bulletin 1-87-4

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# PROFESSIONAL BULLETIN

1-87-4 • DECEMBER 1987


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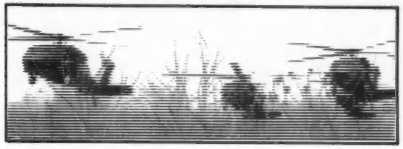

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Second class postage paid at Daleville, AL, and additional mailing offices.

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**Major General Ellis D. Parker**
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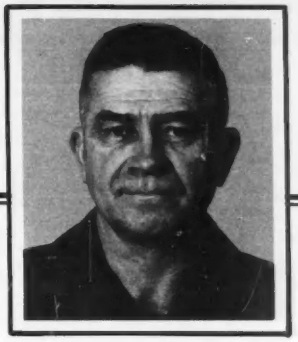


# ARTEP Mission Training Plans

IN CONJUNCTION with Army initiatives, the Aviation Branch has long striven to perfect its ability to measure the effectiveness of unit combat performance by evaluating unit training, equipment and personnel readiness, and tactical doctrine adherence. Without such measures, it is impossible to determine whether current policy or procedural methods maximize the unit's ability to fight and win on the modern battlefield.

To assess a unit's combat effectiveness, evaluators must measure its performance against standards derived from established doctrine. Currently, we use the Army Training and Evaluation Program (ARTEP) to both measure our unit's combat effectiveness and to serve as a guide for leaders to conduct effective training. The ARTEP provides an outline of collective tasks, conditions and standards. It also suggests training support requirements, such as devices or equipment, which assist in performance-oriented training. Unfortunately, a gap exists between the actual performance of the task and the combat scenario in which it would be performed. This makes it difficult for the commander to translate the ARTEP outline into a realistic training experience.

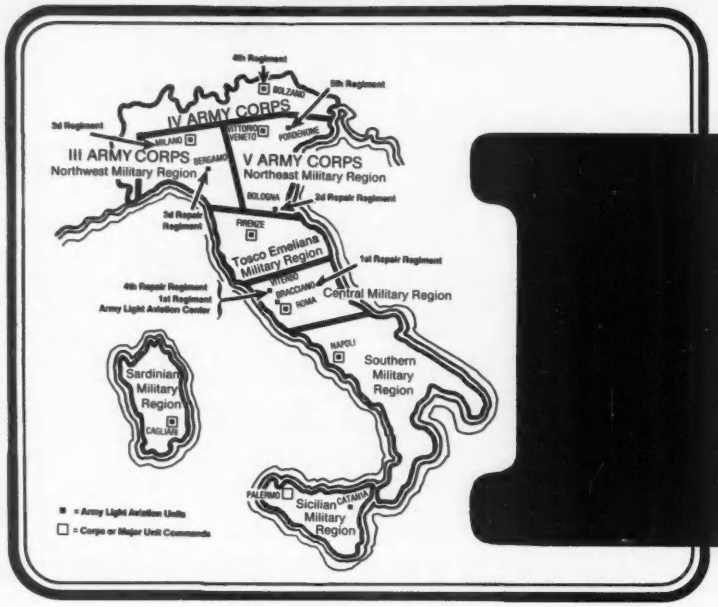
To fill this gap, the Army is upgrading its training and evaluation program over the next several years by developing an enhanced system that will be tailored more to the specific needs of the individual unit. The end result of this effort will be a separate ARTEP Mission Training Plan (AMTP) for each company/troop and battalion/squadron level organization. In addition to supplying the commander descriptive training and evaluation outlines, the new AMTP suggests situational training exercises that support mission performance in field training exercises. Hence, this matrix not only provides units a description of *what* to train (as do current ARTEPs), but also offers scenarios that aid the commander in *how* to effectively train his unit. Included in the new documents are examples of operation orders and fragmentary orders, as well as time planning schedules, which provide excellent training aids to unit leaders. The AMTP is designed to allow the unit to retain the flexibility afforded it by the old ARTEP while also providing more specific guidance to commanders when developing training situations that will increase realism and improve combat effectiveness.

Regarding this new ARTEP training program, I have two points of guidance to share with you. First, I want to stress the importance of your input to this process while it is still in its infancy. The Aviation Center will publish AMTPs for seven types of units between now and fiscal year 1990. These units include the assault helicopter company, the air cavalry troop, the attack helicopter company, the medium helicopter company, the regimental aviation squadron, and the target acquisition reconnaissance company. Additionally, the Aviation Center will consolidate all headquarters and headquarters company, headquarters and headquarters troop and headquarters and service company AMTPs into one manual entitled, "Aviation Command and Staff," to be published on the same schedule.

The Aviation Center has begun circulating some of the preliminary and coordinating drafts of these manuals to approving agencies, proponent schools and selected using units in accordance with Training and Doctrine Command Regulation 310-2. We are soliciting comments. This is your chance to make an impact on how we train—I urge you to take advantage of it.

Second, I want to stress that this new AMTP, like the ARTEP, is a training program—not a test. The objective of all aviation training is preparation for future battles. We train the way we plan to fight and win, not to pass the test. Use the AMTP with that in mind.

**FIGURE 1: Location of ALA units.**




# ITALIAN

ITALIAN ARMY Light Aviation (ALA) was created 35 years ago. As with U.S. Army Aviation, it fulfilled the need to perform liaison, reconnaissance and direction of artillery fire missions.

The growth of ALA parallels the emergence of the helicopter in the late 1950s, and the rapid development of rotary wing technology in the 1960s when the range and intensity of its employment was broadened.

Today, ALA is the youngest component of Italian ground forces, playing an ever increasingly significant role on the AirLand Battlefield.

Until recently, ALA was organized with one battalion in each division or military region, and a regiment in each corps for a total of 26 battalions at 20 bases.

As a result of the Italian Department of the Army's decision to eliminate the division, the ALA is being reorganized in order to perform its mission (figure 1). To do so, the ALA has three new structures:

- Regiments of army corps.
- Operational reserve regiment.
- Military regions' battalions.

Most division battalions will be incorporated within regiments of army corps, but some will strengthen military region battalions. This will provide army corps and military region commanders with the minimum capability needed to conduct essential training and operational missions. It also will increase the amount of equipment—especially weapons systems—and people needed to bolster command and control capabilities at regiment and battalion headquarters. This will decrease the number of battalion headquarters and logistics support units at first and second level maintenance by concentrating supplies and technical personnel. The overall number of bases will be reduced.

The reorganization will set up four new battalions of attack helicopters and establish more centralized and economic helicopter employment.

At national level the command and support organization structure consists of the ALA Director and the Army Aviation Materiel Command (AAMC).

The director, who answers to the Chief of Army General Staff, commands the Army Light Aviation Center where all aviators and technicians are trained. He also commands the 1st Regiment as "operational reserve" and is responsible for personnel assignments and aviation related training in operational brigades, army corps and territorial support units.

AAMC, a part of both the Army Materiel Command and the Logistics Command, presides over the Logistics Branch for Army Aviation supplies. This includes four third level repair regiments deployed over the National territory.

**Lieutenant Colonel Ezio Carfagnini**

Italian Army Liaison Officer
U.S. Army Aviation Center
Fort Rucker, AL

# ARMY LIGHT AVIATION

Each supports a preestablished number of flight units.

**Operational Tasks.** ALA is charged with facilitating command and control (C&C) through liaison, reconnaissance and observation missions; extending the range of tactical ground reconnaissance by conducting scout missions; providing ground forces with timely, close fire support from helicopters armed with machineguns, rockets, missiles and an aerial mine delivery capability.

ALA also is charged with conducting air assaults with special ground units and airmobile movement of other units on the AirLand Battlefield. Further, it greatly increases tactical mobility of logistical and maintenance units.

**Civil Assistance Tasks.** ALA is especially adept at providing assistance and accomplishing civil defence missions in emergency situations. Such tasks during peacetime are assigned to ALA by the Italian government.

On short notice ALA is prepared to conduct daily search and evacuation missions of casualties (particularly in the mountains). Crews are on alert from all units according to a preestablished territorial distribution.

Assistance is required almost yearly in areas hit by floods or earthquakes, which are fairly frequent in Italy. During the summer, support of firefighters is common in all parts of Italy.

ALA expends about 3,000 hours per year in civil defence operations, making it the main instrument by which the Army performs this role.

Also, since 1979, ALA has provided a special helicopter unit, "ITALAIR," to support the UNIFIL contingent in Lebanon.

**ALA Employment Principles.** Army Light Aviation is under the command and control of the army corps or military region to which flying units are assigned either permanently or as reinforcements. It provides airmobile/air assault operations for the ground forces and flies combat or reconnaissance patrols and various other flight missions. These actions can be conducted by tactical units consisting of nonhomogeneous aircraft with or without ground forces.

ALA's tactical structure is mainly centralized at army corps level with calibrated and temporary aviation missions assigned to minor units (brigade or tactical group). Missions are generally planned and launched from temporary airfields, generally at battalion level. Aircraft are flown mostly in the terrain flight mode with variable techniques (low level, contour, nap-of-the-earth) as the contact line is approached.

Italian Army Aviation does not have specific ground forces dedicated to air assault or heliborne operations. But, this need is met by training some mechanized infantry units in heliborne operations. Operational procedures are periodically tested during exercises and in basic training.

# ITALIAN ARMY LIGHT AVIATION

Army Aviation command and control is exercised within Army Aviation regiment headquarters and Army Aviation battalion headquarters, which during operations are located inside army corps or military region headquarters. Tasks, procedures and aircraft are tested and improved within the framework of an army corps C&C operational system.

**Personnel.** ALA has about 800 aviators—55 percent officers and 45 percent noncommissioned officers (NCOs).

Officer aviators come either from the military academy or military schools.

Academy officers maintain their Army specialties and have to spend some periods of duty in other Army units to be promoted. One year at the staff college is mandatory for all captains coming from the military academy, and those selected to attend the second year leave Army Aviation but maintain their flight status and pay.

Officer aviators from military schools maintain their Army specialties, but perform their entire careers in Army Aviation units, as do NCO aviators.

Due to the large number of soldiers who request Army Aviation, NCO student pilot records are screened. Consequently the majority have high school diplomas.

**Aircraft.** ALA has about 500 aircraft. The light airplane, SM-1019, although broadly based on the Cessna O-1 Bird Dog airframe, is a new design powered by the Allison 250-B17B turbine engine. It operates at company level, in military region battalions and in mountain Army corps battalions, flying mainly liaison, surveillance of empty and rear zones, and radiological and photographic survey missions. The SM-1019 can be armed with rockets to provide fire support in particular operational situations.

**The Italian Army Light Aviation employs a variety of aircraft including (clockwise from far left): Agusta A-109 Hirundo scout aircraft, AB-412, AB-206 reconnaissance aircraft (similar to the OH-58) and the SM-1019 light fixed wing airplane.**

The reconnaissance helicopter, AB-206, is similar to U.S. Army Aviation's OH-58 Kiowa. Located at army corps and military region battalions, it normally is armed with a minigun for self-defence. Missions are mostly liaison, reconnaissance and forward aerial observation; but it is not used as a scout.

For the scout role, and missions with antitank helicopters, ALA expects to use (as an intermediate scout) the modified version of the Agusta A-109 Hirundo. A special model of the Agusta A-129 Mangoose (Italian for Mongoose) will inherit the scout mission (more about this later).

**Utility Helicopters.** ALA's utility helicopter fleet consists of four types of UH-ls—the B, D, H and twin-engine N models. Their operational lives are being extended through improvement programs. Meanwhile ALA awaits an A-129 utility variant or the European helicopter NH-90, which is part of a joint program that endeavors to establish operational requirements that can be accommodated by various National industries. The aircraft can be armed with machineguns and rockets.

ALA's medium transport helicopter is the CH-47C Chinook. The 29 recently delivered are operated by the Operational Reserve First Regiment. These Agusta-assembled helicopters will keep ALA's fleet of CH-47Cs operational until the year 2000 because they have been modernized much like the U.S. Army's CH-47D. The modernization consists mainly of: replacing the T55-L-11 turboshafts by the T55-L-712s; a transmission modification to increase the payload from 17,100 to 23,100 pounds; replacing the rotor blades with advanced composite blades; upgrading avionics and navigation. The aircraft also can be armed with machineguns for self-defence.

The liaison helicopter is the A-109 Hirundo, a twin-engine, high-performance helicopter with an instrument flight rules capability, manufactured by Italian industry since the 1970s. A limited number were introduced as an

**Italy is located in the southern part of Europe. Its surface is about 300,000 square kilometers (two times that of Alabama) with 57 million inhabitants. Italy's most important cities are: Rome, the capital; Milan, the most industrial city; Venice, a tourist city; and Naples, the biggest city in the south.**

**Military territory in Italy is divided into a combat zone and seven military regions: Northeast, Northwest, Tosco-Emiliana, Central, Southern, Sicily and Sardinian military regions. Responsibility for territory defence is:**

- **The III, IV and V Army Corps in the combat zone.**
- **Military region in the central and southern parts. Some NATO headquarters are located in Italy:**
- **Allied Forces Southern Europe (AF South) in Bagnoli, near Naples;**
- **Allied Land Forces Southern Europe (Land South) in Verona;**
- **Allied Naval Forces Southern Europe (NAV South) in Nisida, near Naples;**
- **Allied Air Forces Southern Europe (Air South) in Naples.**

# ITALIAN ARMY LIGHT AVIATION

Army Aviation liaison helicopter. Armed with the TOW missile, it was used as a test bed to prepare the introduction of a combat helicopter specifically designed for the antitank role.

A more specifically military version of the All-109 soon will replace a number of AB-206s, and also will be used to equip one experimental company to test the operational requirements for a dedicated scout version of the A-129.

**Training.** Viterbo, a city 50 miles north of Rome, has been the home of Army Light Aviation since 1958. ALA's training base, with 28 helipads, is Europe's largest heliport. Its 50,000 aircraft movements a year make it the third busiest airport in Italy. Three major units operate on this base:

- The Army Light Aviation Center, a training establishment directly subordinate to the ALA directorate.
- The First Regiment "ANTARES," an operational unit with CH-47 and AB-212 (UH-1N) helicopters, is directly subordinate to the Army General Staff.
- The Fourth Repair Regiment, a maintenance organization supporting the First Regiment ANTARES, is directly subordinate to the Army Aviation Materiel Command.

All ALA personnel training (pilots and maintenance technicians) is conducted at the Army Light Aviation Center. Altogether, 38 different types of courses are taught—18 for pilots and 20 for maintenance people.

Training problems are handled by the Operational, Training and Intelligence Department (which maintains liaison with the directorate). Academic and practical training are conducted by the Course Department.

There is only one minor difference between officer and NCO flight training—that being academic training for the employment of aircraft. This is because of the difference in military knowledge between the two groups.

Training lengths depend on types and categories of courses. The basic course for pilots runs about 13 months while others (transition, qualification and so on) are 3 to 16 weeks.

Italian regulations require all pilots (Army, Navy and Air Force) to receive basic flight training at an Air Force school. Then, they attend specific courses at Army Light Aviation Center.

ALA Center *basic* maintenance courses last from 7 to 17 months while others are from 4 to 20 weeks.

To carry out ALA tasks it is essential to ensure that students acquire terrain flight capabilities. Consequently, tactical courses, which represent the most delicate "moment" in the training process of ALA aviators, contain the real specialization phase of flight training. It is taught in three different courses:

- Tactical pilots (this represents the final phase of the basic course).
- Aircraft commanders (for experienced NCO pilots only).
- Tactical unit commanders (for officer pilots having a minimum of 500 hours in helicopters).

At the end of the tactical pilot qualification phase ALA student pilots participate in live exercises with onboard armament systems.

The ALA Center also conducts mountain flight training classes in operational areas of the units to which pilots will be assigned. The courses qualify them to operate in

The Agusta A-129 Mangoose is a new antitank helicopter.

their respective environments.

After ALA training the "new" pilots have acquired all required basic flight capabilities. Then, after having flown 500 hours minimum in their units, the pilots come back to the ALA Center to complete their training in the Unit Commander Course (for all officer pilots) and the Aircraft Commander Course (only for the most experienced NCO pilots).

ALA flight training uses about 115 fixed and rotary wing aircraft, and two kinds of flight simulators.

Flight simulators have saved ALA a considerable amount of time and money. The Center's flight simulator department, considered the most modern in Europe, consists of two Belgian-manufactured, fixed wing simulators obtained in 1977. They are used to train students on the Siai-Marchetti 1019. Four Canadian CAE Agusta-Bell UH-1H simulators are used to train helicopter pilots in basic and instrument refresher training. One of these simulators, fitted with a McDonnell Douglas computer-generated visual system, simulates day, night and twilight flight conditions.

**Safety.** According to the safety people, ALA, with an average of about 50,000 flight hours per year, suffers one or two mortal accidents and six to nine less serious accidents every year.

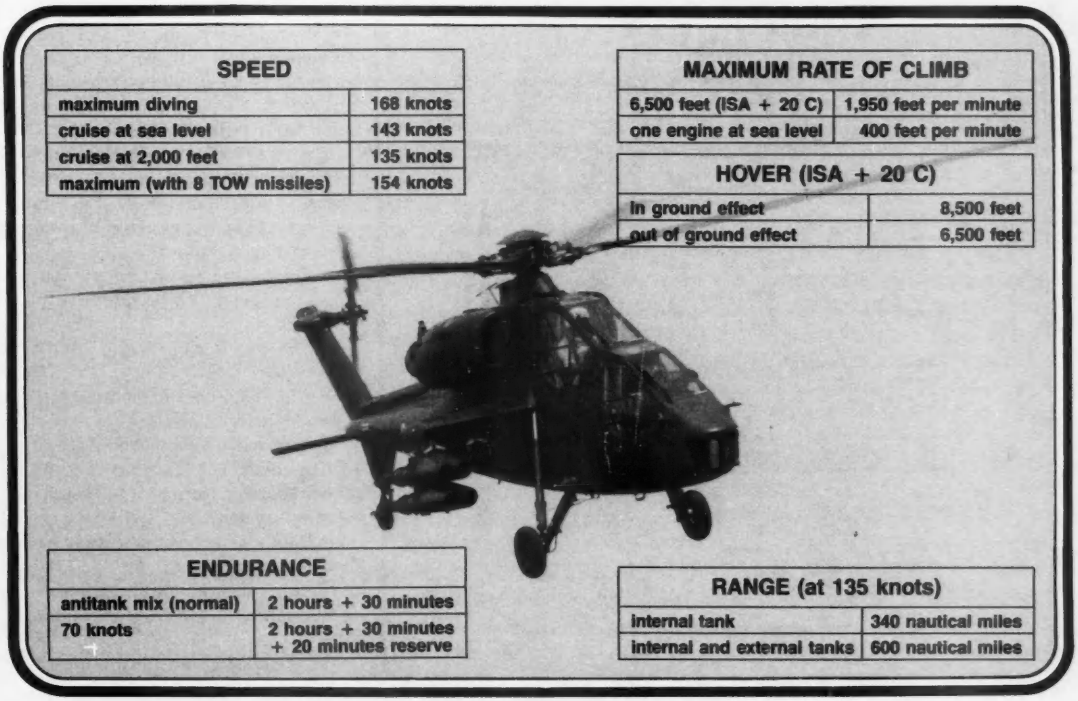
The ALA Center also studies operational problems posed by the constant evolution of Army Aviation; develops new equipment and conducts related operational tests; and writes regulations, technical manuals and other publications.

**The A-129.** A new helicopter, the antitank Agusta A-129 Mangoose, is scheduled to be introduced this year. It represents a change of philosophy for the employment of Italian ALA.

In 1970, the Italian Army General Staff recognized the need for a dedicated antitank helicopter. Initially, it appeared that West Germany would join this development program but, due to some difficulties that could not be resolved, Italy proceeded alone with the A-129 program.

The Italian Army has identified an initial requirement for at least 60 A-129As. They will comprise four

**FIGURE 2: A-129 performance at maximum takeoff weight.**


SPEED
maximum diving 168 knots
cruise at sea level 143 knots
cruise at 2,000 feet 135 knots
maximum (with 8 TOW missiles) 154 knots
MAXIMUM RATE OF CLIMB
6,500 feet (ISA + 20 C) 1,950 feet per minute
one engine at sea level 400 feet per minute
HOVER (ISA + 20 C)
in ground effect 8,500 feet
out of ground effect 6,500 feet
ENDURANCE
antitank mix (normal) 2 hours + 30 minutes
70 knots 2 hours + 30 minutes + 20 minutes reserve
RANGE (at 135 knots)
internal tank 340 nautical miles
internal and external tanks 600 nautical miles

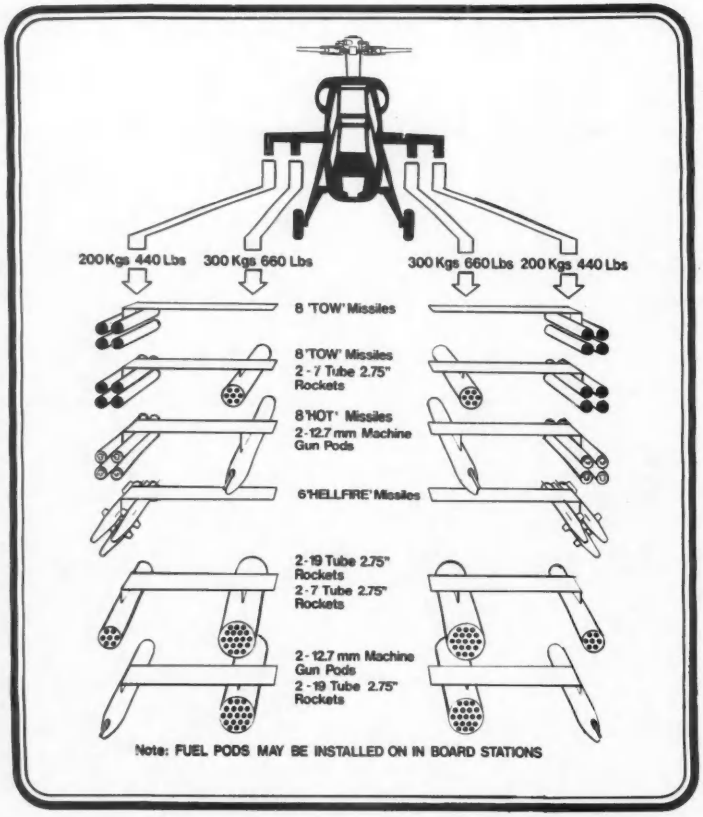
operational battalions, each based on two companies of antitank helicopters and one company of six scouts. ALA is still studying this new organization.

To evaluate and prepare tactics for the A-129, ALA modified two Agusta A-109 Hirundos into an antitank configuration by installing the TOW missile system.

The first prototype A-129 flew in September 1983, and prototype production ended in 1985. Operational tests were conducted in 1986.

The A-129 rotor system consists of a fully articulated, four-blade main rotor and a two-blade tail rotor—each with bearings made of an elastomeric substance.

**FIGURE 3: A-129 armament payload.**


200 Kgs 440 Lbs
300 Kgs 660 Lbs
300 Kgs 660 Lbs
200 Kgs 440 Lbs
8 'TOW' Missiles
8 'TOW' Missiles
2 - 7 Tube 2.75" Rockets
8 'HOT' Missiles
2 - 12.7 mm Machine Gun Pods
6 'HELLFIRE' Missiles
2 - 19 Tube 2.75" Rockets
2 - 7 Tube 2.75" Rockets
2 - 12.7 mm Machine Gun Pods
2 - 19 Tube 2.75" Rockets
Note: FUEL PODS MAY BE INSTALLED ON IN BOARD STATIONS

Each main rotor blade has a very low vibration level and consists of a glassfiber spar, a Nomex honeycomb leading and trailing-edge, and skin of composite materials. The hub is equipped with a swashplate of glassfiber composites. All mechanical linkages and moving parts are housed inside the rotor mast.

There are no lubricated bearings in the rotor head. The tail rotor blades are also made of composite materials.

Another feature of the A-129 is its ability to fly for more than 30 minutes without lubricating oil, or after the blades have been hit in any location by a 12.7 mm projectile.

The rate of climb, figure 2 (page 7), shows (among other main performance data) the power of the engines. The A-129's external tanks allow it to fly the entire length of Italy from north to south.

The A-129 is the first helicopter in the world to adopt B-1B and space shuttle technology by employing a fully integrated multiplex system that handles:

- Communication and navigation to automatic flight control fly-by-wire.
- The monitoring of the engine and system.
- Automatic performance computation in realtime.
- Warning and condition management.
- Integrated helmet and display sighting system.
- Pilot's night vision sight interface and fire control.

Figure 3 shows the various armament configurations required by the Army.

A-129 missions will be mainly in antitank roles. But, by the pro-

| | A-129 MANGOOSE | AH-1S COBRA | AH-64 APACHE |
|---|---|---|---|
| MISSION GROSS WEIGHT (KG) | 3,700 | 4,545 | 8,022 |
| POWER (HP) | 2 × 850 | 1 × 1,800 | 2 × 1,536 |
| MAX CRUISE (KM/H) | 265 | 225 | 293 |
| HOGE (M) | 2,700 | (not available) | 3,780 |
| ENDURANCE | 2+30 | 2+30 | 1+50 |
| ARMAMENT (A/T) | 8 TOW | 8 TOW | 18 HELLFIRE |
| OTHER ARMAMENT | ROCKETS/GUN | ROCKETS/GUN | ROCKETS/GUN |

**FIGURE 4: Aircraft comparisons.**

gressive replacement of the TOW system either with a fire-and-forget missile like HELLFIRE, or an air-to-air missile like Stinger or Mistral, ALA expects to use the Mangoose as a light attack helicopter. Figure 4 depicts the A-129's main performance compared with the AH-1S Cobra and the AH-64 Apache.

Taking advantage of its technology, Agusta is studying four A-129 variants that are supposed to meet Italian armed forces and international needs (particularly European). While it is not easy to predict developments of these programs, the accomplishment of some of them would allow both economic and practical advantages.

The *first variant* is the antiship version that Agusta will develop in accordance with Navy requirements. In comparison with the basic version, the antiship variant should essentially change the acquisition and armament system.

The *second variant* is to meet Italian Army and hopefully some international requirements in regard to a new type of utility helicopter. The feasibility of this program depends mainly on the results of the agreement among some European firms (including Agusta) concerning the European new concept utility helicopter NH-90.

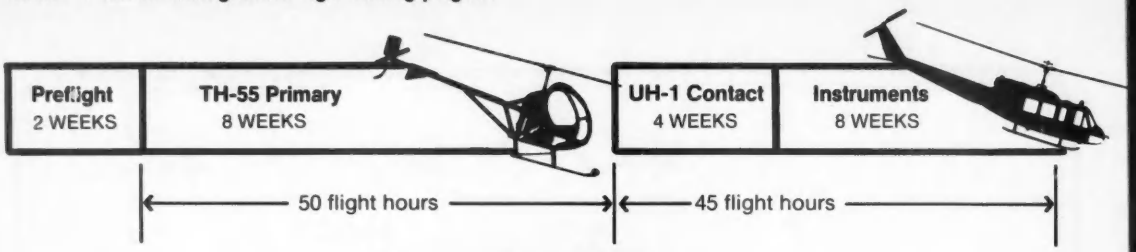
Italian Army Light Aviation is most interested in the third variant. ALA does not have a dedicated scout helicopter. So *the third variant will be a scout version of the Mangoose*, expected to be produced in 1990.

The *last variant* would be a joint Italian-British production of a light attack helicopter.

Since 1985, Agusta and Westland have been studying the feasibility of this version that would be the second joint project. The first is the EH-101, a medium-transport helicopter that should replace ALA's CH-47 and standardize the medium-transport helicopter fleet in the Italian armed forces and probably in other European countries.

It is evident that the development of all or some of the A-129 variants can reduce the cost of each version and also improve logistical and maintenance support. Because of this, we expect the rate of production in the internal and international markets to increase.

FIGURE 1: Current undergraduate flight training program.




**Captain Anthony Brogna**
Office of Personnel Systems
Directorate of Aviation Proponency
U.S. Army Aviation Center
Fort Rucker, AL

# MULTITRACK

## POSTURING THE AVIATION FORCE TO MEET THE CHALLENGES OF THE NEXT CENTURY

A MAJOR MILESTONE in the evolution of Aviation Branch is scheduled to occur on 12 May 1988. On that day, the "modi operandi" for training in the U.S. Army's Initial Entry Rotary Wing (IERW) program at Ft. Rucker, AL, will convert to the multitract (MT) concept. The primary aim of the MT concept is to ensure that the evolution of our aviator flight training program matches the swift tempo of our fielding of complex technology and realization of new tactics and doctrine.

"Individual training is the foundation on which unit effectiveness is built. It is the source of a soldier's confidence and trust in the Army."
Arthur S. Collins Jr.

Most of us are familiar with the current undergraduate and graduate flight training programs. Figure 1 is a linear flow diagram depicting the current undergraduate flight training program with the program flow at the top and flight hours at the bottom. Note that IERW flight training consists of 175 hours of flight instruction in as many as three different rotary wing aircraft, plus 42 hours of instruction in the synthetic flight training system (SFTS). Primary air skills are taught using the TH-55 Osage, while the UH-1 Huey is the training platform used during the transition and instrument phase and, finally, combat skills are taught in either the UH-1 or OH-58 Kiowa.

Shown in figure 2 is the current graduate flight training program (aircraft qualification course [AQC]) in place at Ft. Rucker. Total flight hours for each transition are listed on the right-hand side of the figure.

Under the MT concept of flight training, students will receive primary and instrument training in the

MONTHLY WRITING AWARD

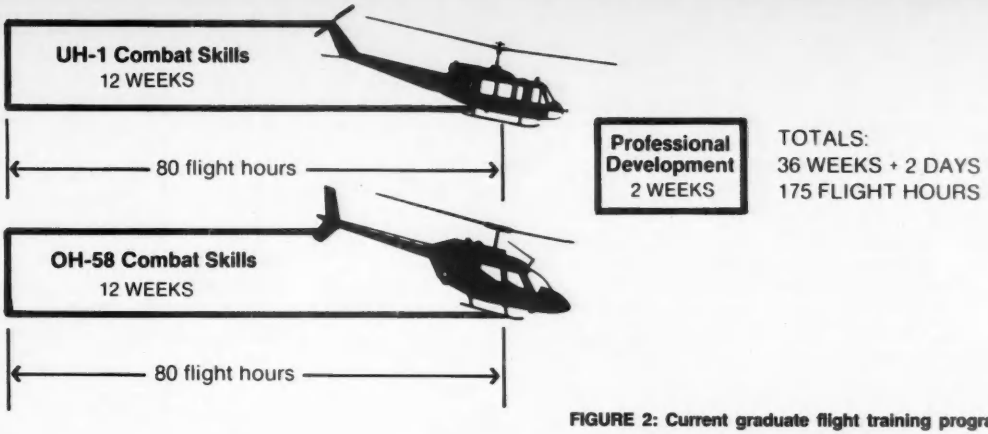



**FIGURE 2: Current graduate flight training program.**

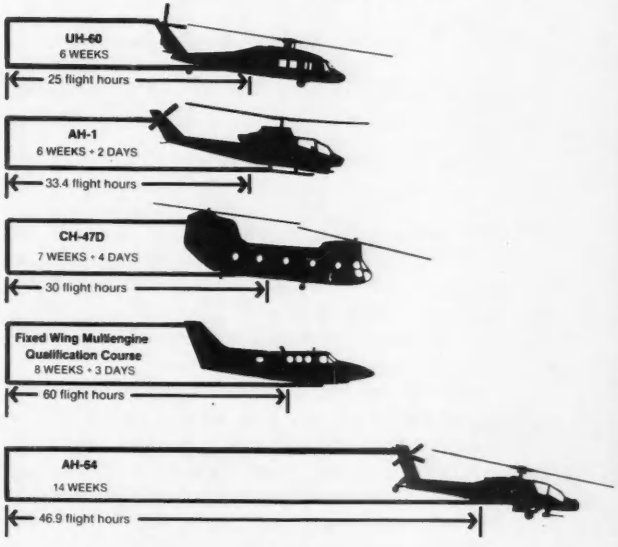
UH-1. Following instrument training, the new aviator will complete IERW in his specific combat aircraft (currently scheduled to include the UH-1, OH-58, UH-60 Black Hawk and AH-1Cobra). Figure 3 is a flow diagram for the IERW program scheduled to start 12 May 1988. Also listed are the total flight hours associated with each track of IERW. Under MT, the primary phase will increase from 8 to 10 weeks, while the instrument phase will remain the same as the current IERW program. The combat skills phase of IERW will have an increase of 10 training days and 12.5 flight hours. Aviators being tracked into the UH-60 and AH-1 will learn their visual flight rules low level navigational skills in the UH-1 prior to transitioning into those aircraft. Those aviators in the AH-1 flow also will receive gunnery training during IERW. All MT graduates will be qualified in the UH-1 plus any additional aircraft they have been tracked into.

The program of instruction (POI) for the graduate flight training will remain unaffected by MT implementation.

So why MT? If it "ain't broken don't fix it," right? Well, to properly answer these questions, we need to take a short look at the philosophies and history behind the MT concept.

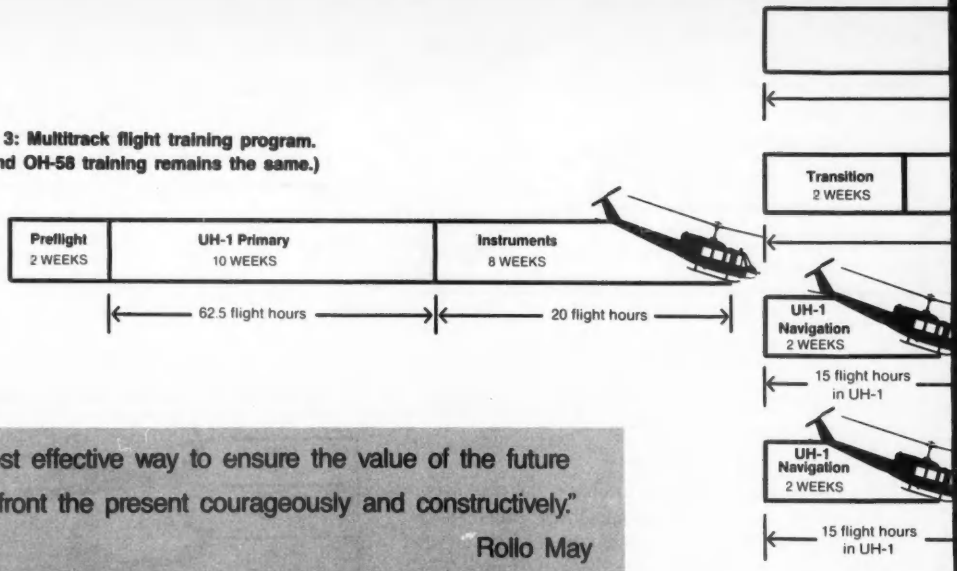
The current IERW flight training program has been in place since 1978. Since that time, the composition of the Army Aviation fleet has changed significantly. The active fleet contains more than 10 different airframes, yet our initial flight training program produces only two flavors of aviators. Our technological progress has outpaced our advancements in initial flight training.

The basic premise of the MT concept is not new—additional tracks added to IERW to produce a mix of




"If you want to make enemies, try to change something. You know why it is: to do things today exactly the way you did them yesterday saves thinking."
President Woodrow Wilson

**FIGURE 3: Multitrack flight training program. (UH-1 and OH-58 training remains the same.)**




"The most effective way to ensure the value of the future is to confront the present courageously and constructively."

Rollo May

aviators that is roughly comparable to the mix of the fleet. Doing this has been attempted many times in the past. Previously, the main obstacle to creating the additional aircraft tracks was the constraint on the various resources needed to implement such a program.

In 1984, the Department of Gunnery and Flight Systems (DGFS) was tasked to work up a new developmental plan for the MT concept. According to COL Merwyn L. Nutt, former director of DGFS, their initial look into using the MT concept appeared relatively easy—tack the current AQC POI onto IERW. However, as the MT team at DGFS began to formulate their MT plan, it became apparent that implementation of the MT concept offered a unique opportunity to revamp the entire IERW flight training program.

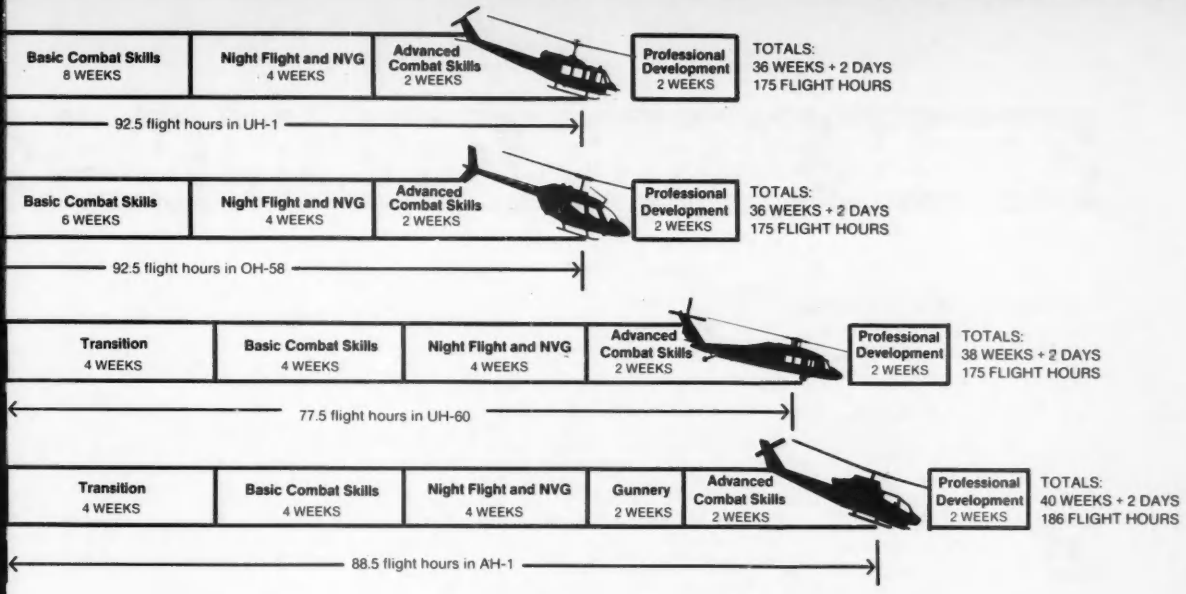
First, the use of the TH-55 primary trainer no longer seemed the best way of doing business. The TH-55 does not "mirror" any airframe in the inventory (it lacks hydraulics, turbine engine, etc.), it seats only two; also, students are still trying to learn to fly the UH-1 when they enter the instrument phase. It was also determined that 12.5 blade hours per aviator are spent on learning TH-55 specific skills. By using the UH-1 as the primary trainer, many advantages can be realized, including:

- Improvement of basic airmanship and aircraft handling.
- Reduction in training turbulence.
- Students will be better able to concentrate on instrument training since they will have better grasp on UH-1 flying.
- UH-1 to remain in inventory into 21st century.
- Simplification of maintenance at the Army Aviation Center.

Using the UH-1 as the primary trainer is not a new and untested notion; many foreign students who have come to the Aviation Center for initial flight training have been successfully trained using the UH-1 as the primary trainer. By employing the UH-1 as the primary trainer, the proposed MT POI allows for increased solo time and the introduction of cross-country navigation during the primary phase.

Next, the MT team concluded that rather than just adding advanced aircraft transitions to the back end of IERW, it would be far more advantageous to fully integrate advanced aircraft training into the combat skills and night portions of IERW. Evident by comparing figures 2 and 3, is that those MT IERW students who are tracked in either the UH-60 or AH-1 track will receive nearly three times the flight hours of those aviators who receive their instruction in the current AQC. For the recipient aviation commander, this means that newly assigned MT IERW aviators will be ready to begin mission training immediately.

By December 1986, the MT concept had been developed, the aircraft requirements ascertained, the Aviation Center position established and required decision briefings conducted at the Training and Doc-




trine Command and the Department of the Army.

On 22 January 1987, the Chief of Staff approved the MT concept. On 17 February 1987, the Secretary of the Army approved implementation of MT.

What issues remain to be resolved concerning MT implementation? The answer is multiple, including such diverse items as airspace planning, SFTS usage, instructor pilot train-ups, TH-55 turn-in, warrant officer date of rank (since UH-60 and AH-1 tracks graduate later than UH-1 and OH-58 tracks), and the impact on the current aviator force. The "midnight oil" is being burned at the Aviation Center and elsewhere to ensure MT implementation issues are being solved appropriately. Let's look at just a few of the issues being reviewed:

- How will students be selected for specific tracks? Although the final algorithm has not yet been developed, it will finally be some combination of student choice, needs of the branch, results of some type of written psychological disposition test and aviator physical measurements.
- What effect will MT implementation have on the rest of the current aviator force? The bad news is that the availability of UH-60 and AH-1 AQCs for the current aviation force will decrease. This is required due to the transfer of resources to MT. As a long-term effect, aircraft qualification of an individual aviator will be a key factor in the assignment process as the branch single tracks aviators in their aircraft. The good news is that new aviators arriving in your unit will be safer aviators and far more proficient in their aircraft.
- Will other aircraft be added to MT to even further reflect the fleet makeup? The answer is yes, with the CH-47D Chinook track currently scheduled for fiscal year (FY) 1990 and AH-64 Apache track planned for either FY 1991 or 1992 (depending on when the fleet inventory stabilizes). Even though our fixed wing assets make up a significant percentage of the inventory, a fixed wing track will not be added to MT. This is due to the need for all Army aviators to be proficient in rotary wing combat skills.
- Is the UH-1 the permanent trainer for IERW? Actually, the use of the UH-1 is an interim fix until a proper, dedicated helicopter flight trainer can be procured. The UH-1 is a great helicopter; but it is designed for the utility role, not the training role. A dedicated IERW trainer would have flight characteristics similar to the rest of the fleet, be instrument flight rules equipped, seat two student aviators and have low fuel consumption. The request for proposal already has been submitted for the new IERW trainer.

The MT epoch will soon be upon the Aviation Branch. It will have extensive, positive ramifications for the total aviation force, preparing the branch for the technology and tactics of the future. To quote the Chief, Aviation Branch, Major General Ellis D. Parker about MT implementation, "This will stand for time to come as one of the key milestone decisions for Army Aviation."

# CHEM STICKS/CYALUME®

**Captain David W. Williams**
Directorate of Combat Developments
U.S. Army Aviation Center
Fort Rucker, AL

CHEMICAL STICKS (chem sticks) have been around Army Aviation for several years. They have been used as pilot light aids, vehicle markers and position lights as well as several other unique methods.

The purpose of this article is to inform the field on the availability of the standard chem sticks as well as the new colors, types and shapes of these items.

The basic principle behind the chem stick is that it is composed of two types of chemicals. There is a group of chemicals that are called the Oxalates that supply the energy to the chem stick and another group of chemicals that are called the lumens that will lend the color to the chem stick. Now that we have covered the technical aspects of the chem sticks we'll concentrate on the different types of chem sticks that are currently available for use (see figures), and also those new chem sticks that will be available shortly.

The standard chem sticks are 6 inches long and come in the following colors: red, green, yellow, blue and orange. The newer colors that will be available shortly are white and a new yellow color that is more of a true yellow than the currently supplied yellow chem stick. The yellow chem sticks will be replacing the older ones as they are depleted from the supply system. The life of these standard chem sticks ranges from 8 to 12 hours.

**CYALUME® LIGHTSTICK PRODUCTS**

| | DESCRIPTION | PART NUMBER | NSN | MILITARY UNIT OF ISSUE | CASE PACK EACH | PRICE EACH/CASE AS OF 1 JAN 87 |
|---|---|---|---|---|---|---|
| 6 Inch Standard | Green, 12—Hour | 95270-53 | 6260-01-074-4229 | Box of 10 | 100 | $ .93 ea/$93.00 |
| | White, 8-Hour | 95270-57 | 6260-01-218-5146 | Box of 10 | 100 | $ .97 ea/$97.00 |
| | Red, 12-Hour | 95277-19 | 6260-01-178-5559 | Box of 10 | 100 | $ .95 ea/$95.00 |
| | Blue, 8-Hour | 95277-20 | 6260-01-178-5560 | Box of 10 | 100 | $1.01 ea/$101.00 |
| | Yellow, 12-Hour | 95277-21 | 6260-01-196-0136 | Box of 10 | 100 | $ .95 ea/$95.00 |
| | Orange, 12-Hour | 95270-48 | 6260-01-195-9753 | Box of 10 | 100 | $ .95 ea/$95.00 |
| 6 Inch, Hi-Intensity (Cold Temp.)* | Yellow, 30-Minute | 95270-52 | 6260-01-074-4230 | Box of 10 | 100 | $ .98 ea/$98.00 |
| | Red, 30-Minute | 95270-55 | 6260-01-230-8601 | Box of 10 | 100 | $ .98 ea/$98.00 |
| | White, 30-Minute | 95270-56 | 6260-01-247-0368 | Box of 10 | 100 | $1.00 ea/$100.00 |
| 6 inch, Ultra Hi-Intensity | Internat'l Orange 5-Minute | 95270-43 | 6260-01-247-0363 | Box of 10 | 100 | $1.25 ea/$125.00 |
| 4 inch (UNREP) | Green, 6-Hour | 95270-16 | 6260-00-106-7478 | | 600 | $ .71 ea/$426.00 |

*Thirty minute Hi-Intensity CYALUME lightsticks are an effective source of longer duration light at temperatures below 40°F. The lower the temperature, the longer the duration and the lower the light intensity.

| | | | | | | |
|---|---|---|---|---|---|---|
| 15 inch Standard | Green, 12-Hour | 95270-41 | 6260-01-247-0362 | Box of 5 | 10 | $4.95 ea/$49.50 |
| | White, 8-Hour | 95270-39 | 6260-01-247-0367 | Box of 5 | 10 | $5.80 ea/$58.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 1/2 inch Mini Lightsticks | Yellow, 4-Hour | 95281-04 | 6260-01-209-4435 | Box of 50 | 2000 | $ .28 ea/$560.00 |
| | Green, 4-Hour | 95281-05 | 6260-01-209-4434 | Box of 50 | 2000 | $ .28 ea/$560.00 |
| | Blue, 4-Hour | 95281-07 | 6260-01-209-4436 | Box of 50 | 2000 | $ .28 ea/$560.00 |
| | Light Red, 4-Hour | 95278-54 | 6260-01-230-8600 | Box of 50 | 2000 | $ .28 ea/$560.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 1/2 inch Flexible Bands | Green, 4-6 Hour | 95278-62 | 6260-01-230-8599 | Box of 12 pkg. | 240 pkg of 3 | $1.62 pkg/$388.80 |
| | Blue, 4-6 Hour | 95278-61 | 6260-01-230-8598 | Box of 12 pkg. | 240 pkg of 3 | $1.62 pkg/$388.80 |
| | Orange, 4-6 Hour | 95278-60 | 6260-01-230-8597 | Box of 12 pkg. | 240 pkg of 3 | $1.62 pkg/$388.80 |
| | Light Red, 4-6 Hour | 95278-59 | 6260-01-230-8596 | Box of 12 pkg. | 240 pkg of 3 | $1.62 pkg/$388.80 |

| | | | | | | |
|---|---|---|---|---|---|---|
| PML Survival Light | 5 1/4-inch Green, 8-Hour With Handle | 95270-58 | 6260-01-086-8077 | Box of 50 | 100 | $ 4.15 ea/$415.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Non Visible Infrared | 6", 3-Hour | 95275-01 | 6260-01-195-9752 | Box of 10 | 100 | $ 3.09 ea/$309.00 |
| | 15", 3-Hour | 96270-38 | 6260-01-247-0366 | Box of 5 | 10 | $15.90 ea/$159.00 |
| | 1 1/2", 3-Hour Mini | 95280-10 | 6260-01-247-0364 | Box of 50 | 200 | $ .95 ea/$190.00 |
| | 7 1/2" x 3/16, 3-Hour Flexible Band | 95278-42 | 6260-01-247-0365 | Box of 12 | 120 | $ 1.78 ea/$213.60 |

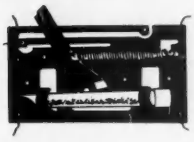
# LIGHTS

**CYALUME® SUPPORT MATERIALS/ACCESSORIES**

| | DESCRIPTION | PART NUMBER | NSN | MILITARY UNIT OF ISSUE | CASE PACK EACH | EACH/CASE |
|---|---|---|---|---|---|---|
| Accessories | Lightstick Shield for 6" Lightstick | 95270-90 | | | 100 | $ .79 ea/$79.00 |
| | Magnetic Base for 6" or 15" Lightstick | 95270-92 | 6260-01-255-3346 | | 25 | $ 2.35 ea/$58.75 |
| | Ground Stake for 6" Lightstick | 95270-93 | 6260-01-230-8555 | Box of 100 | 100 | $ .12 ea/$12.00 |
| | Handle for 6" or 15" Lightstick | 95271-01 | 6260-01-255-3345 | | 25 | $ 2.45 ea/$61.25 |

**NEW TACTICAL DEVICE**

| | | | | | | |
|---|---|---|---|---|---|---|
| Flare, Surface Trip | With one 6" Ultra Hi-Intensity Lightstick | 95271-08 | 6260-01-247-2937 | | 20 | $ 6.95/$139.00 |



**6-inch 12-hour**
- Marking sleeping locations to enhance safety
- Color coding vehicles
- Illuminating convoy SPs/CPs/RPs
- Illuminating LZs
- Marking contaminated zones

**15-inch 3-hour**
- Lighting command posts to reduce sound signatures
- Military police wands
- Illuminating LZs
- Marking fire lanes on ranges

**1½-inch**
- Illuminating poorly lighted instruments
- Marking key personnel during MOPP night operations

**7½-inch**
- Color coding casualty priorities
- Marking cargo hooks on aircraft
- Marking coding refuel hoses at POL sites

**Infrared lights**
- Covert operations
- Marking covert LZs

The currently available 30-minute high intensity lights are supplied in yellow and red. The white chem stick will be available in the high intensity mode. There is also a 5-minute high intensity international orange that is available for use in the trip flare. In addition, a new size of chem stick will be available soon. This is a 15-inch light that will be supplied in green and white. The duration of these lights will be 12 and 8 hours respectively.

There are also chem sticks available that are 1½ inches in length. These lights are: yellow, green, blue and light red (pink for those other people). These lights have a duration of 4 hours. Another is a 7½-inch *flexible* chem stick in green, blue, orange and light red. These lights have a duration of 4 to 6 hours.

All of the above mentioned sizes and shapes also are available in nonvisible infrared. The duration of these items is 3 hours.

Several different types of accessories are available to add flexibility to the use of chem sticks. These include a light stick shield for the 6-inch light, a *magnetic base* for the 6-inch and the 15-inch lights, *ground stakes* for the 6-inch light and also available are *handles* for the 6-inch and the 15-inch lights.

A new device that has been developed and uses the chem stick is the trip flare. This device is delivered with the high intensity international orange, but any 6-inch light can be used in the system to include the infrared light that should provide the threat with a nasty surprise.

Although the chem sticks are functional for use in the cockpit during night vision goggles flight, there are no chemical sticks that are completely compatible with the AN/AVS-6. With input from the Directorate of Combat Developments, the Cyanamid Company is researching the feasibility of producing such a light.

Some of the uses for these chem sticks are listed at left, but the uses for these lights are limited only by the user's imagination.

# AVIATION PERSONNEL NOTES

**Branch and Promotion Qualification**

It is important for aviators to understand both branches and promotion qualification and the difference between the two.

Branch qualification is important because it spells out the minimum requirements needed to become technically and tactically proficient as an aviation officer. Promotion qualification, although having some overlapping requirements with branch qualification, outlines minimum requirements for each commissioned officer promotion board, relative to officers being "fully qualified" for promotion consideration. Both types of qualification are more fully explained below.

As stated, the principal objective of branch qualification is to outline the minimum requirements needed by aviation officers to become technically and tactically proficient. Branch qualification takes place during the company grade years only. The following are minimum branch qualifications required by the Aviation Branch.

*Lieutenant.* Lieutenants will demonstrate mastery of precommissioning skills and the requisite knowledge, education and other requirements outlined in AR 611-110, "Selection and Training of Army Aviation Officers," for entry into the Aviation Branch. They must then successfully complete an officer basic course (OBC), initial entry rotary wing (IERW) flight course and serve in at least one aviation assignment. During this assignment it is highly desirable that they gain troop and flying experience as a section/platoon leader.

*Captain.* This level of branch qualification is attained by successfully completing an officer advanced course (OAC) and serving in one of the following assignments:

- Commander of an aviation unit.
- Commander of a recruiting company or other tables of distribution and allowances (TDA) company.
- Platoon leader while serving in areas of concentration 15C, 15D or 15E.
- Instructor of training/doctrine at the Aviation Center or any other branch school, or serve as an instructor pilot (at the Aviation Center).

Promotion qualification is another matter. Whenever a commissioned officer promotion board is convened, it is charged with selecting the "best qualified" officers for promotion to meet the needs of the Army. In order to compete for promotion as one of those best qualified, each officer must first be "fully qualified." In determining whether an officer under consideration is fully qualified for promotion, board members must satisfy themselves that an officer is qualified professionally and morally, has demonstrated integrity, is physically fit, and is capable of performing the duties expected of an officer (with his or her qualifications) in the next higher pay grade.

To determine the aforementioned qualifications, board members review official photos and records of each officer, and in the past have been provided qualification summary information relative to each branch/function area. As an example, consider what a qualification summary might contain for aviation captains being considered for promotion to major. It would outline minimum requirements to be considered fully qualified, i.e., height/weight standards met; physical training test passed; military schooling to include OBC, IERW and OAC (also, Combined Arms and Services Staff School (CAS 3) for year groups 79 and later); a bachelor's degree completed; and TOE/TDA aviation duty with leadership or staff experience. Further, there would be comments regarding aviation unique considerations such as: accession patterns, direct commissions, aviation utilization, command opportunity and duty considerations distinctive to aviation. Promotion qualification is different for each rank being considered for promotion but does contain some of the same requirements noted under branch qualification. Aviators must understand the difference between these two types of qualifications.

**Lieutenant Colonel Selection**

The 1987 promotion board list for lieutenant colonels reflects favorable percentages for the Aviation Branch. In all three categories (previously-considered, first-time-considered and below-the-zone), the Aviation Branch figures are above the Army average. Increased attendance by aviation officers at Command and General Staff College (CGSC) may be a prime reason for the favorable percentages obtained by the branch. For instance, 98 percent of the aviators selected from among the first-time-considered completed CGSC and 100 percent of aviation below-the-zone selectees are CGSC graduates. The message is

clear, CGSC is a must to be competitive for promotion to lieutenant colonel. The chart below shows the comparison of Aviation Branch and Army statistics from the 1987 Lieutenant Colonel Board.

| | Previously Considered/ Selected | First Time Considered/ Selected | Below Zone Considered/ Selected |
|---|---|---|---|
| Army | 1,104/80 | 1,904/1,324 | 1,742/95 |
| Percent | 7.2 | 69.5 | 5.5 |
| Aviation Branch | 190/16 | 252/179 | 182/11 |
| Percent | 8.4 | 71.0 | 6.0 |

**FIGURE 1: 1987 Lieutenant Colonel Board statistics.**

### Career Management Field (CMF) 28 Merging into CMF 67

A joint work group, consisting of personnel from the Aviation Support Command, U.S. Army Signal Center, Soldier Support Center, U.S. Army Military Personnel Center, U.S. Army Logistics School, and the Army Aviation Center met at Ft. Rucker during June 1986 to discuss the merger of CMF 28 (Aviation Communications Electronic Systems Maintenance) into CMF 67 (Aircraft Maintenance). The proposed plan was presented to Major General Ellis D. Parker, Aviation Branch chief, in February 1987 and was conceptually approved. The proposal was next submitted to the Soldier Support Center for scrutiny by personnel managers. After some wording and administrative concerns were clarified, the proposal was sent to major Army commands for the current staffing action. The actual merger will begin about October 1988 and take 1 year to complete.

The proposal will convert 35K, 35L, 35M, 35P and 35R to 68N, 68L, 68Q, 68P and 68R respectively. Once implemented, career progression will occur in the basic military occupational specialty (MOS) from the rank of PV1 through SSG. This is a change from the current practice of having avionic MOS cap in 35P at the rank of SSG. Under the new proposal, the SFC capper MOS will be 68P (Avionic Supervisor); at the rank of MSG, 68P will become 67Z (Aircraft Maintenance Senior Sergeant) and progress to SGM.

### Recommendations for Enlisted Promotion and School Selection

The following recommendations concerning promotion/school selection boards have been extracted from the last Sergeants Major Academy selection board. These recommendations will benefit all aviation soldiers in preparing for any Department of the Army centralized selection board. For all boards the number of personnel selected is keyed to the projected requirements; thus, school and promotion requirements remain tough and only the best are selected. Analysis from the latest board indicates that key points for noncommissioned officers are:

- Seek and attain a variety of MOS related jobs; always demonstrate technical competence and strive for leadership positions.
- Pursue both technical and leadership courses in the military education system.
- Keep military records correct. Performance fiches must be checked at least annually.
- Keep photograph current. It's the photograph that "reports" to the board.

Promotion opportunities are further increased when aviation unit leaders write solid, factual enlisted evaluation reports (citing responsibilities and leadership) and encourage self-improvement through continuing military and civilian education.

*Using all of these recommendations* in preparation for school/promotion boards will greatly enhance the chance of selection for aviation soldiers.

### Master Sergeant (MSG) Selection Board

Aviation Branch soldiers did exceptionally well in some MOSs while other aviation MOSs had a zero selection (due to over-strength situations) on the FY 87 MSG selection board. The overstrength MOSs having zero selections are 35P, 93D and 93J. The Army average for selection was 10.8 percent while the overall branch selection rate was 19.3 percent.

A final note, the FY 87 MSG board restricted consideration to graduates of the NCO Advanced Course; those aviation soldiers who have not completed the course must attend as soon as possible to remain competitive for promotion.

| MOS | Considered | Selected | Percent |
|---|---|---|---|
| 35P | 92 | 0 | 0.0 |
| 67G | 31 | 7 | 22.6 |
| 67R | 19 | 4 | 21.1 |
| 67T | 161 | 29 | 18.0 |
| 67U | 89 | 16 | 18.0 |
| 67Y | 139 | 35 | 25.2 |
| 68J | 31 | 6 | 19.4 |
| 68K | 55 | 15 | 27.3 |
| 93D | 30 | 0 | 0.0 |
| 93J | 38 | 0 | 0.0 |
| 93P | 65 | 33 | 50.8 |
| Total Aviation Branch | 750 | 145 | 19.3 |
| Total Army | 20,916 | 2,269 | 10.8 |

**FIGURE 2: MSG selection rates by MOS.**

# The Platoon Leader's Role In Aircraft Maintenance

THE MOMENT you've been waiting for finally arrived. The company commander called you into his office and informed you that you're his newest platoon leader.

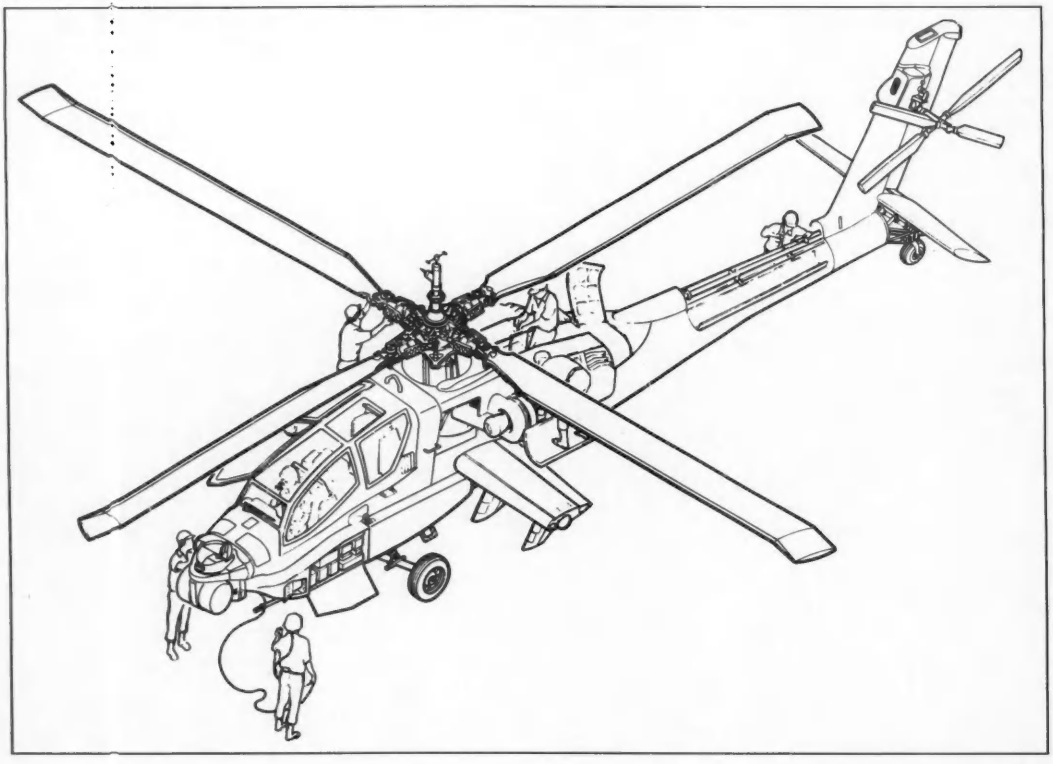
You listen anxiously and take meticulous notes as he outlines your duties. Later, while reviewing your notes you realize that the commander told you one of your responsibilities is maintenance management of the aircraft in your platoon. You have no idea what you can do about maintenance; after all, you're not a maintenance officer.

That's where this article can help. Its purpose is to provide you with some tips regarding your responsibilities in maintenance management. By adopting the following procedures you will reduce downtime, improve maintenance and ultimately raise the combat readiness of your aircraft.

For simplicity I've grouped the information under three major subject areas: the aircraft, forms and records, and procedures.

### Aircraft

The best way to learn about your aircraft is to talk to the people that fly them and fix them. The pilots, mechanics, phase team chiefs, shops' noncommissioned officer in charge, technical inspectors, arma-



**Captain Bruce J. Reider**
Aviation Training Brigade
U.S. Army Aviation Center
Fort Rucker, AL

ment repairmen, and the maintenance officer can all tell you a little about the condition of your aircraft. Talk to them frequently.

Look at the aircraft themselves. Are they clean? I always told my platoon leaders that if something looked screwed up, it probably was. That's especially true for aircraft. Establish a policy in your platoon that engine decks and rotor heads will be wiped clean before and after flight to aid in detecting leaks and to make preflight easier. Are there old performance planning cards, flight plans, forms and weather briefing forms in the cockpit areas? If so, make it a standing operating procedure that the crew will remove them upon termination of a flight. Inspect your aircraft daily at the close of business to ensure that they are topped off, properly covered and secured. If you don't have all the fly-away gear on hand, then order it. Taking care of your aircraft will instill pride in the members of your platoon. They'll care about the aircraft they fly in and consequently take better care of them.

**Forms and Records**

Forms and records can tell you a great deal about your aircraft. They should be studied and analyzed. Ask commonsense questions about maintenance write-ups. You can start this process by obtaining a copy of DA Pamphlet 738-751, "Functional Users Manual for the Army Maintenance Management System-Aviation (TAMMS-A)."

This manual is a ready reference for all aircraft maintenance forms. It explains their use and the proper method of completion. Begin with the DA Form 2408-13, Aircraft Inspection and Maintenance Record. Look to see how long deficiencies have been written up, paying particular attention to the red X conditions that down the aircraft. Find out what actions are being taken to correct the faults.

Next look at the DA Form 2408-14, Uncorrected Fault Record. Ensure that red X write-ups are not listed on the dash 14. All valid write-ups should have a document number if awaiting parts or a work order number if awaiting support maintenance. Reconcile document numbers with tech supply and work orders with production control. Check to see that requests are still valid and find out their status.

The DA Form 2408-18, Equipment Inspection List, should be checked for inspections coming due to make sure that parts such as packings and filters are on hand. By knowing what inspections are upcoming you can schedule their completion without impacting significantly on other maintenance, and save downtime over weekends.

An awareness of what information is on the forms and records for your aircraft along with sound management will probably reduce downtime and improve the availability rate without a wrench having ever been turned.

**Procedures**

The final means by which you can influence aircraft maintenance is to establish sound maintenance practices. First and foremost, ensure that all maintenance is supervised by your platoon sergeant. Next, check to see that the correct manuals are being *used*, and not just sitting on the aircraft. Additionally, you should make sure that foreign object damage cans are available and being used. By enforcing these procedures you will see a steady improvement in the quality of maintenance being performed.

Maintenance is generally regarded as noncommissioned officers' business. Before you try any of the recommendations listed above, you should talk with your platoon sergeant. Get him involved. Tell him your desires and then listen. He has the experience and the expertise to help you. He can explain procedures and introduce you to the key people in the maintenance chain. For this system to work most efficiently, the two of you must work as a team.

Tips that I've listed don't require any mechanical ability. A simple understanding of maintenance procedures coupled with some basic management skills will get the job done. By taking an active role in maintenance you will win the respect of your pilots, maintenance personnel and your commander.

Finally, the experience will help you to become a better platoon leader and ultimately a better commander.

**Sergeant First Class John W. Conyers**
ATC/NAVAIDs Maintenance Division
10th Air Traffic Control Battalion
Fort Rucker, AL

# 10th Air Traffic Control Battalion

THE 10TH Air Traffic Control Battalion has been at Ft. Rucker, AL, for many years under several different unit designations, but unlike the name, its primary mission has always remained the same—supporting the Army Aviation training program. This is done by operating 13 stagefields and 5 basefields along with an Army radar approach control (ARAC) and 2 flight coordination centers. Add to this the en route beacons, VHF omnidirectional ranges, instrument landing systems, ground controlled approach (GCA) radars and the myriad of communications equipment located in some of the most remote cow pastures or off the narrowest back roads; just finding some of these facilities can in itself be a major feat.

To help accomplish its mission, the 10th Air Traffic Control Battalion has a unique section designed to ensure success. the ATC/NAVAIDs Maintenance Division is a consolidated maintenance section comprised of 36 civilian and 8 military personnel dedicated to performing all echelons of maintenance on the assigned air traffic control systems and equipment peculiar to those systems. The division performs maintenance almost exclusively onsite to prevent service interruptions due to the size and multifaceted use of the equipment.

The support mission of the division is so critical to the Army Aviation Center training program and the National Airspace System (NAS) that the civilian maintenance personnel are graded by Federal Aviation Administration (FAA) criteria. It is divided into four separate branches, designed to cover specific geographic areas and/or specific systems peculiar to air

traffic control within the Ft. Rucker-Army Aviation Center training area; a vast area that requires an average of 20,000 miles a month to be logged on the division's 19 assigned vehicles. Thanks to an aggressive driver safety program, these have been accident-free miles for more than 20 years through southeastern Alabama and parts of Georgia and Florida.

*ARAC Maintenance Branch* provides 24 hours per day, 7 days per week maintenance support and certification of electronic systems used by the Cairns ARAC facility to control aircraft within an assigned area of the NAS. The major systems supported are the ARTS-IIIA (automated radar terminal system), ATC-BI-5 (air traffic control beacon interrogator system), solid state video mapping system, continuous data recording system and the ASR-5 (airport surveillance radar system).

*NAVAIDs Maintenance Branch (West)* provides unit through intermediate level maintenance support and certification of electronic communications, GCAs and ATC ground navigational systems and fixed Army airfields and stagefields within the western half of the Ft. Rucker airspace system.

*NAVAIDs Maintenance Branch (East)* provides identical support for the eastern half of the Ft. Rucker airspace system excluding the radars, but with a higher density of other systems to include the ARAC communications systems.

*Weathervision Branch (WxVISION)* provides all echelons of maintenance support and certification for the aviation weather data distribution systems associated with air traffic control and pilot training throughout the Ft. Rucker airspace system. Systems maintained by this branch are the weather and educational TV microwave systems, emergency operations command system, BRITE radar terminal and display equipment, and the weather distribution system at Ft. Rucker and Troy airfields.

The maintenance personnel assigned to the division must attend both Department of the Army and FAA schools to remain proficient on the ever-changing maintenance procedures and equipment used in air traffic control. An active on-the-job training program is used to train incoming personnel, teaching not only equipment maintenance and documentation, but also to take pride in their work.

A visit during a typical day at the division can be very boring unless you travel with one of the technicians out to the sites. A technician assigned to one of the NAVAIDs branches has a primary responsibility for several sites visited on a regular basis. During these visits, the technician performs maintenance checks and services equipment to maintain system reliability.

At those facilities that are manned by operators, checks are made of the daily equipment inspection and maintenance worksheet and any corrective actions required are performed. To document actions, besides the normal Army maintenance forms and records, the technician must maintain a monthly Facility Maintenance Log (FAA Form 6030-1) at each facility/site to enter detailed accounts of each visit to the site, regardless of the reason. At the end of each entry, the technician enters a certification statement listing any system limitations, if any, and to whom they were reported. This information is compared to criteria set by the FAA to determine if any detrimental effect on flight safety will be caused by continued use of the equipment.

Although the FAA and the U. S. Army Air Traffic Control Activity schedule and perform periodic flight and ground inspections of the ATC systems, the technician will always request unscheduled inspections after any realignment or outage that could possibly affect the accuracy or dependability of the system. Safety of flight is the number one consideration of the technicians.

Basic first-aid and cardiopulmonary resuscitation (CPR) techniques are a training requirement for all maintenance personnel assigned to the division with instruction provided annually by a qualified CPR instructor. Just as the division looks out for pilot safety, it also ensures action is taken to provide for the technician's safety.

Soon again, the 10th Air Traffic Control Battalion may undergo a name change, but the mission will always remain the same—to support the Army Aviation training program.

(Editor's Note: Effective 20 November 1987, the 10th Air Traffic Control Battalion officially became the 1st Battalion, 11th Aviation Regiment.)

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# Back to the Basics

CAN YOU FLY an airplane and maintain a level pitch attitude and constant altitude in visual flight rules conditions without the aid of any aircraft instruments? How long has it been since you, as an instructor pilot, asked an aviator to perform slow flight, steep turns or a traffic pattern using only outside references throughout the maneuver? How many aviators really understand the relationship of pitch, power, bank and trim when applied to basic attitude flying techniques?

If you find yourself unable to complete a contact maneuver without minimum aid of the aircraft's instruments, perhaps a review of basic attitude flight techniques is due.

When an aviator begins flying an unfamiliar aircraft, the first thing the instructor pilot should demonstrate is the aircraft's attitude in different flight regimes using points on the ground or the horizon in reference to some selected portion of the aircraft's structure.

In most aircraft, cruise climb, safe single engine climb speed and landing attitude are basically the same when referenced to the horizon. Descent and final approach attitude also are similar while cruise and slow cruise attitudes are different. In short, transitioning aviators should be aware of the four different attitudes that they will be required to use in all flight maneuvers.

Target power settings should be established for normal cruise, slow cruise, approach and descents. For any desired aircraft performance, there is a corresponding power setting and attitude that should be taught to the aviator. These airplane attitudes and power settings should be demonstrated and understood by the aviator before he attempts a normal traffic pattern, which is an advanced maneuver.

The tendency is to introduce the aviator to the aircraft in the traffic pattern; this allows no time to learn or review the basics. If the instructor pilot finds the aviator is having trouble in the traffic pattern, he should head for an airwork area and review the basics.

Whenever the instructor pilot finds the aviator reacting to the aircraft instead of anticipating what the aircraft will do, some basic training in pitch, power and trim is needed.

The basics are transferred to all contact maneuvers and instrument flight. The aviator who does not have a thorough understanding of the basics cannot develop proficient skills in either basic or advanced maneuver requirements. In other words, he will continue to react to, instead of anticipate, aircraft performance.

For example, the aviator who cannot consistently perform slow flight while maneuvering in various aircraft configurations will most likely be unable to consistently perform precise and safe powered approach, precision landings or an instrument landing system approach. Inconsistent performance in the foregoing maneuvers will be indicative of poor understanding of the basics (pitch, power and trim).

When properly understood, the principles of pitch, power and trim are transferable skills. For example, an aviator proficient in maneuvering a U-21 aircraft as a result of a good understanding of the basics, i.e., anticipate rather than react to aircraft performance, will be able to transfer those skills and knowledge to other aircraft with minimum training.

Conversely, an aviator who is mechanical to the extent that aircraft flying skills are a result of reaction

to, rather than anticipation of, aircraft performance, will likely require extended training when transitioning into additional aircraft. Simply stated, the aviator must learn to fly each aircraft as opposed to transferring basic flying skills and knowledge to accommodate the mechanics of a particular aircraft.

It is recognized that flying proficiency is perishable. If you don't use it, you lose it! The Aircrew Training Program provides a means to ensure that aviator knowledge and proficiency are maintained. It does not readily provide a training environment compatible with acquiring basic aviator skills.

This places responsibility on the instructor pilot to ensure that while training or evaluating, noted deficiencies in an aviator's performance are not a result of a lack of understanding of the basics.

An instructor pilot who flies with an aviator who has trouble with contact maneuvers or instrument approaches must be aware that the aviator may not need additional training in the maneuvers, but may need training to help him get back to the basics.

The aircrew training manual assumes that the aviator is proficient in basic flying skills and provides for continuation training, i.e., reinforcement of the basic skills and knowledge the aviator possesses.

Conversely, FC 1-221, "Fixed Wing Instructor Pilot Handbook," provides maneuvers designed to develop a thorough understanding of the basics that are transferable to all aircraft.

It is imperative that the instructor pilot maintain a positive awareness and employ the fundamentals provided in FC 1-221 or Federal Aviation Administration approved publications rather than rely totally on the maneuvers and procedures provided in the aircrew training manual, which focuses on continuation/mission training.

Getting back to the basics will enhance and increase our aviators' confidence. Challenge yourself to learn or relearn attitude flying techniques and nail down the basics again.

*DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Ft. Rucker, AL 36362-5000; or call us at AUTOVON 558-3504 or Commerical 205-255-3504. After duty hours call Ft. Rucker Hotline, AUTOVON 558-6487 or Commercial 205-255-6487 and leave a message.*

## U.S. Army Class A Aviation Flight Mishaps

| | Number | Flying Hours | Rate | Fatalities | Total Cost (in millions) |
|---|---|---|---|---|---|
| FY 87 (through 31 December) | 8 | 391,193 | 2.05 | 10 | $26.5 |
| FY 88 (through 31 December) | 4 | 391,193* | 1.02 | 0 | $6.9 |

*estimated

# AVIATION LIFE SUPPORT STORY

**Ms. Marty van Duyne**
Public Affairs Office, U.S. Army Garrison, Fort Huachuca, AZ

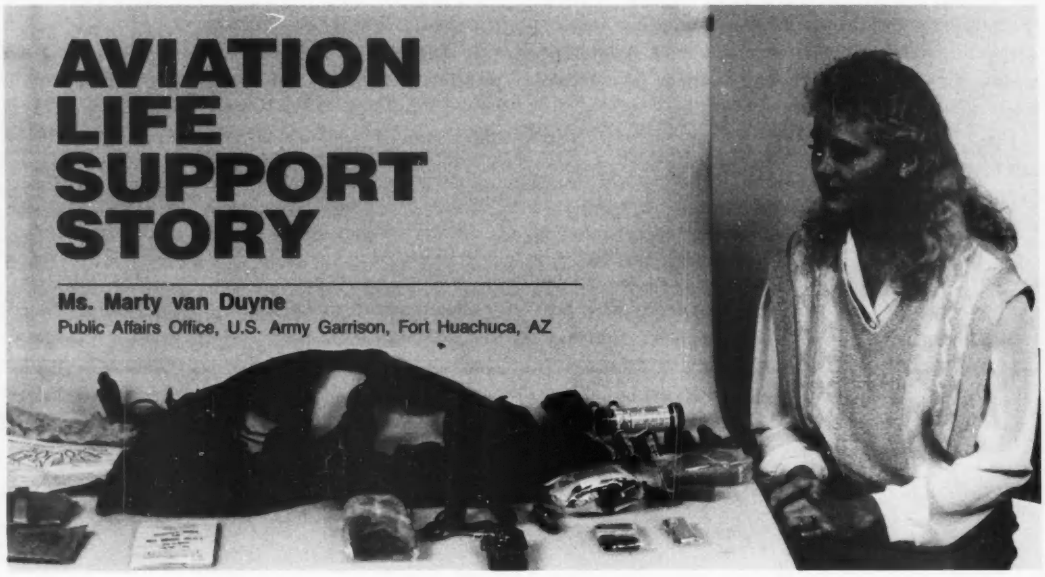

photo by Benjamin Martel

MAYDAY, MAYDAY! *Army sicks niner seven* going down. Vector *ate thuree two*—engine failure.

A distress call from any aircraft soaring at 20,000 feet is perhaps one of the most frightening experiences above the face of the earth. But, to Army pilots and aircrew personnel trained and equipped with today's aviation life support equipment (ALSE), the situation does not mean imminent death.

Since the year 1960, the Army has been involved in ensuring that all of their fixed and rotary wing aircraft are equipped with the most modern technology available for the protection and support of life.

The Army Aviation Systems Command, St. Louis, MO (a major subordinate command under the Army Materiel Command, Alexandria, VA), has recognized the need for a consistent ALSE program. According to Mr. A. B. C. Davis, former AMC project officer for ALSE, aviation life support equipment is inherent to aviation safety.

"ALSE is a major component of everyday flight operations, but it is of vital importance to the combat aviator on tomorrow's battlefield experiencing the problems of survival, evasion, resistance and escape as a result of enemy fire. These aviators' combat survivability is dependent upon their training and survival equipment," said Mr. Davis.

Currently, all Army aircraft are required to be equipped with ALSE in accordance with AR 95-17, and ALSE is categorized into three types: environmental system, escape and descent system, and survival and recovery subsystem.

photo by Joe Lolley

**To serve as protection and comfort from the elements during normal flight conditions, environmental ALSE includes armor protection, crew support restraints, oxygen/smoke NBC, and hypoxia warning devices.**

## ENVIRONMENTAL ALSE

Environmental ALSE consists of armor protective equipment, crew support restraint, environmental control, flash protective equipment, aircrew protective clothing, accessories and equipment, oxygen/smoke, nuclear, biological and chemical (NBC) and protective masks and hypoxia warning devices. This ALSE ensures optimum protection and support including comfort for aircrew personnel in normal flight environments.

**The Martin-Baker ejection seat provides safe egress in an emergency situation.**

## AVIATION ESCAPE AND DESCENT SUBSYSTEM

The aviation escape and descent subsystem provides for safe, reliable egress and descent from disabled aircraft. This equipment is designed to function in forced escape, controlled descent, or manual and ground escape. Present equipment includes ejection seats, lap belts, restraint and parachute harnesses, emergency parachutes and propellant-actuated devices. New technology has improved seating and restraint devices that aid in more rapid ground and water egress. These factors, along with the current state-of-the-art materials that reduce the hazards of fire have greatly improved the chances of survivability.

**The ACR Model TS-23 SDU-5/E test set is a self-contained, portable unit used to test the strobe light housed in the SRU-21/P survival vest.**

## AVIATION SURVIVAL AND RECOVERY SUBSYSTEM

The ALSE survival and recovery subsystem provides the necessary equipment to aid survival, escape, evasion and recovery of downed aircrews and passengers in any environment. This equipment is divided into five categories:

- distress incident locators and communications
- flotation equipment
- survival equipment
- signal flares
- survival kits and vests.

Current equipment includes:

- life preservers
- life rafts
- antiexposure suits both fitted and quick-don
- arctic clothing
- survival kits
- survival vests.

Also included are the all-important signaling devices such as: lights, flares, beacons, survival radios and power sources for their operation.

Most of the aviation life support components contained in the subsystems, although serving a main purpose, have multifunctional capabilities.

photo by Benjamin Martel

**The SRU-21/P lightweight survival vest contains a lensatic compass, marker panel, survival radio and several other life preserving items to be used in all types of aircraft except the OV/RU-1.**

## SURVIVAL VESTS

The SRU-21/P survival vest is a complete survival package that may be worn by aircrew personnel in all types of Army aircraft except the OV/RU-1. The package weighs 7½ pounds and is issued in two sizes—large and small.

The vest is made of lightweight knit nylon cloth with pockets for survival components. It can be worn with body armor, parachute and underarm life preservers. It can accommodate both a .38 caliber revolver holster and a survival knife. The webbing of the vest can be seasonably adjusted to fit heavy winter clothing.

The survival vests contain the following items: individual tropical survival kit, magnesium fire starter, water bags, radio receiver-transmitter, pocket knife, distress marker light, whistle, space blanket, a signal kit with flares that will penetrate through foliage, revolver with holster and ammunition, signaling mirror, first aid kit, lensatic compass, tourniquet, packing list and operators manual.

The OV-1 aircraft survival vest is similar in design to the SRU-21/P survival vest but differs slightly in style as it is designed specifically for use with the rigid seat survival kit (RSSK) and ejection seat parachute harness system. This vest also incorporates the LPU-10/P life preserver and the SRU-31/P survival packets.

Both vests are self-contained survival units that are worn over the Nomex flight suit and/or jacket and zipped up before each flight. On the SRU-21/P survival vest, the life preserver harness is worn under the vest with the life preserver pulled through each armpit opening so that it hangs out of the vest. The vests are sized to fit over both front and back body armor.

photo by Tom Greene

**Although the SPH-4 protective helmet is primarily designed for inflight use, its functions are almost limitless.**

## HELMETS

The SPH-4 protective helmet provides hearing and crash protection, and serves other purposes while in flight. A retractable visor provides protection from glare, windblast and dust. It is also equipped with communication devices, including microphone, headset, cord and connectors.

The current SPH-4 helmet is constructed of lightweight fiberglass with an energy-absorbing foam liner. There is a suspension assembly that attaches the crown pad and front and rear headbands to the shell. It is also equipped with ear cups, ear pads and a chin strap.

Although the main purpose of the helmet is for inflight use, it can serve many other needs. The helmet can be covered partially with bright luminous strips of tape, so it also serves the purpose of aiding in detecting and locating survivors, especially during night hours. In a desert environment the helmet will provide extra head and neck protection from strong sun rays, and the visor will serve as additional eye protection from sunglare. In a water survival situation, the helmet can be used as a bouyant and as an emergency flotation device. With a little ingenuity, the helmet can aid in land, as well as air or water survival. The visor can be used as a shovel for digging through soft ground surfaces, and the helmet itself can be used

as a basket for gathering and storing food supplies or as an additional container for storing fresh water.

**Protective flight gear is a must in any climate. These clothing articles provide protection for most parts of the body.**

## PROTECTIVE FLIGHT CLOTHING

Protective flight clothing currently in use includes coveralls, flight gloves, jackets and hoods.

The sage green coverall is a one-piece, unlined garment with a zip front closure with two breast pockets, a pencil compartment on the upper front left sleeve, two thigh pockets, two lower leg pockets and a knife pocket on the left thigh. The coverall is made of a polymide (Nomex) fabric that resists high temperatures and retards flame. It is not fire-proof and will char at about 700 to 800 degrees Farenheit.

Aircrew personnel are also fitted with flight gloves that are constructed of soft, gray, nonslip cabretta leather for the palm and front portion with stretchable Nomex fabric for the entire back portion.

Jackets, whether the summer type or the U.S. Air Force adopted extreme cold climate, are similar in style. They feature full length front zippers, a biswing back, knit wristlets and waistband, two front pockets with hook and pile fasteners and a combination cigarette pouch and pencil compartment on the upper left sleeve.

The extreme cold weather hood features a front full length zipper closure, rear partial length zipper and hook and pile underarm fasteners. It is an insulated synthetic material and is designed for use with the extreme cold climate jacket.

Although these clothing articles provide comfort and ease of movement while used in flight, their design and functionability are truly tested in a survival situation.

The coverall provides protection from the elements for all parts of the body except the hands, feet, neck and head. This almost total body coverage is important whether you are in extreme cold or in a desert environment. In a desert environment, when faced with high temperatures, the body will dehydrate more quickly when large areas of the skin are exposed to the strong sunlight. The many pockets that are part of the coverall carry vital survival equipment, and in a cold climate also can be used as a means of additional insulation from the elements. Natural foliage can be gathered and stuffed into the larger pockets to help insulate against the cold. In an emergency sea survival situation, the coverall can be removed, knotted at the end of each leg opening, inflated manually with air, then knotted just below the arm section and used as a flotation device.

The gloves, with their nonslip quality, provide a valuable tool for climbing, as well as providing additional protection for the hands for digging or grasping harsh objects. They also can be tucked conveniently into other parts of clothing to provide additional insulation or padding (for knees, elbows, etc.). Although just about any part of the clothing can be used as emergency first aid bandaging, the gloves, although not sterile, are of a size that can be easily adapted as a compress or as padding under a splint.

The jacket pockets serve as a means to carry survival gear. But jackets can be used for a variety of purposes. When not needed to retain body warmth, they can be folded and used as cushions, opened flat and used as partial ground covers or secured to other equipment or natural foliage and used as sheltering devices. The extreme cold weather hood makes an excellent pillow.

## OXYGEN MASKS

Army Aviation personnel flying aircraft or mission profiles that require oxygen masks normally will find one of two pressure-demand masks available.

In-flight oxygen breathing devices permit the breathing of gaseous oxygen from pressure-demand regulators and are capable of holding oxygen under positive pressure. The masks weigh between 11.5 and 13 ounces and can be used with the flight helmet. Both masks are equipped with microphone assemblies for communication.

photo by Benjamin Martel

**The MQ-1A preflight tester is used to detect malfunctions for the oxygen mask. The oxygen mask can be used with the flight helmet.**

## NBC PROTECTIVE EQUIPMENT

Army aviators are also equipped with NBC protective equipment. In a nuclear attack, even indirect viewing of a nuclear blast can cause flash blindness. The initial blast of radiant energy can also cause flash burns of exposed skin and can be incapacitating, especially around the eye area. Biological contamination is a contagious and casualty-producing weapon and can produce either immediate or delayed action. Chemical agents, such as nerve gas, in a dosage the size of a pinhead (5 milligrams) can be absorbed through the skin, eyes or lungs and will cause death. A 6-second exposure to a 10-milligram-per-cubic-meter concentration of a nerve agent will cause contraction of the pupil of the eye (miosis), loss of depth perception and possibly pain upon focusing. This is an incapacitating dosage for an Army aviator.

Current NBC equipment consists of an overgarment ensemble including chemical protective overboots, overgarment trousers and shorts, gloves, mask and aircraft protective hood and mask.

Special training in the use, maintenance, storage and disposal of the NBC equipment is dictated by the technology of design and the inherent hazards of NBC exposure.

## FLOTATION EQUIPMENT

Current flotation devices in use by Army aviators include life preservers and life rafts.

The LPU-2/P and LPU-10/P life preservers are personal flotation devices for use by aircrew personnel and passengers. These two preservers are identical externally when packed. They consist of two neoprene-coated fabric flotation cells packed within envelope-type containers. The containers attach to an adjustable harness that secures the life preserver to the wearer's body.

Life raft assemblies in use by the Army encompass five styles and sizes. All are designed to keep personnel afloat with all of their survival equipment until rescued.

The LR-1, LRU-3/P and the LRU-4/P are one-man life rafts. These rafts are inflated by a $CO_2$ bottle and can be orally blown-up or provided with supplemental air by mouth. Although these rafts are designed primarily for single person use, they are capable of carrying two persons safely and securely when mounted in the correct manner.

The Army also equips its aircraft with 20-man, and 7-man life rafts dependent upon the mission and type of aircraft. These multipersonnel rafts are similar in operation to the single person rafts, but incorporate more sophisticated components, are larger in size and are stowed in the fuselage of the aircraft.

Besides the inherent flotation survival features, the life rafts also can be used for land survival purposes.

They make excellent shelters and sleeping platforms and can be used for crossing streams, lakes or ponds. The various components of the larger rafts, such as the ropes, can be used for a multitude of other purposes, both on land or sea. Although it is not advisable to remove the life preservers while afloat in a raft, they function exceptionally well as pillows.

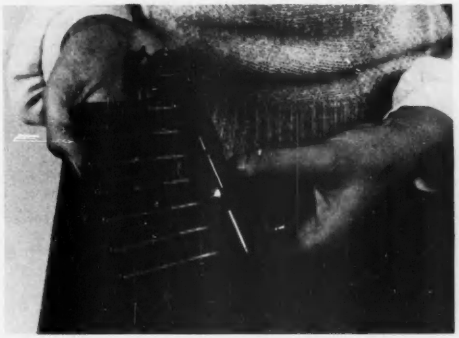

photo by Benjamin Martel

**Included in the individual aircraft survival kits are seven pen flares. Caution should be exercised in firing the flares.**

## AIRCRAFT SURVIVAL KITS

Individual survival kit for the aircrewmember is divided into two categories: The individual kit for all Army aircraft and the RSSK for the OV-1 aircraft. Each kit is configured to support aircrewmembers in one of three environmental extremes: hot climate, cold climate or over water. These kits are designed to supplement and function with the appropriate survival vest and components installed.

The individual survival kit's components are housed in a zippered canvas outer case that has a web carrying handle. Two straps that are attached to the zippered canvas inner case extend through the opening in the outer case. The straps have quick-release ejector snaps to attach to a parachute harness if required. The outer case is marked with the type of kit configuration. The kit measures 5½ × 15 × 19 inches. The hot and cold climate kits weigh 28 pounds and the over water kit weighs 29 pounds.

The over water kit differs slightly from the other two kits in that the outer case slide fastener (zipper) slide is the activation device for the life raft. It is activated by a simple unzipping movement.

A different style kit is in the OV-1 aircraft and is housed in a fiberglass container that is an integral part of the ejection seat.

The components for all configurations are contained in a carrying case that is inside the RSSK. This kit measures 9 × 15× 14½ inches. The hot and cold climate kits weigh 33 pounds, 2 ounces each and the over water kit weighs 44 pounds.

In using the over water RSSK, the life raft is deployed after the parachute is deployed and before entering the water. The life raft is activated by squeezing and pulling either of the quick-release handles. This action releases the bottom portion of the "clamshell." The weight of the clamshell, the survival components and the life raft extend the retaining line that is connected to the life raft inflating cylinder and valve, which activates the life raft inflation sequence. In a bailout situation, the equipment bag will enter the water first, followed by the life raft and then the aircrewmember—with all three attached together by the retaining line.

photo by Benjamin Martel

**The first aid kit is a part of the survival package and it is required to be aboard all aircraft.**

## FIRST AID KITS

All aircraft are required to be equipped with first aid kits that are stored aboard the aircraft. In addition to the aircraft kit, first aid kits are a part of the survival vests. The kits vary in their medical components.

The SRU-21/P survival vest contains the individual, tropical, tactical aircrew survival kit.

The OV-1 Mohawk survival vest contains the SRU-31/P individual airman's survival kit that is comprised of two packets. The first packet is the general packet, containing the individual airman's survival kit. The second packet is the medical packet. The vest and components are designed for use with the RSSK on the OV-1 Mohawk ejection seat.

All individual survival kits for hot climate, cold climate and for over water include the individual first aid kit. It is part of the complete survival package to be carried onboard all Army aircraft when environmental conditions along the route of flight dictate hot, cold or over water survival conditions. Components of the kit are contained in a plastic case that is housed in a nylon outercase.

All life raft assemblies carry three first aid kits, except the LRU-4/P (one-man) raft. The LRU-4/P life raft assembly is normally a part of the over water RSSK of the OV-1 Mohawk ejection seat and does not contain a first aid kit since the first aid items are contained in the survival vest and the RSSK.

The 4-man, 6-man and 7-man life rafts carry three first aid kits in the accessory container of the raft. All first aid kits are inspected in accordance with an established schedule.

## BODY ARMOR

Helicopters have become a vital part of current military strategy, as speed and mobility are needed to meet the changing tactical and terrain consideration of modern warfare. Besides tactical and logistics support, they provide medical evacuation for peacetime and combat operations. Constant exposure of helicopters and aircrews to enemy small arms fire and shell fragmentation makes the use of protective armor essential to mission success. Because of weight limitations and effect on aircraft performance, it is not feasible to install complete armor protection on aircraft. Although the newer Army gunships and transports have some built-in protective armor for most critical parts, aerodynamics necessitate protecting the aircrew by use of individual body armor.

Weight limitations of the aircraft, available space, individual maneuverability and performance of duties limit the coverage and the type of body armor that aircrew personnel can use effectively. For maximum protection to vital body areas, it weighs less and is more comfortable and, based upon combat use, has proven both physically and psychologically acceptable.

Aircrew body armor consists of front and back armor plates with a cotton and nylon carrier to accommodate the plates. Large pockets in the front and back of the carrier are lined with ballistic nylon felt and are designed to fit the curvature of the plates. The carrier has adjustable shoulder straps, waistbands and ballistic nylon felt shoulder pads give additional comfort and protect against shell fragmentation. The armor plates are made of rigid ballistic-defeating material and are worn selectively to protect the front and back torso from the lower neck to the waist. When needed, the pilot and/or copilot wear the armor carrier with only the front plate inserted because their seats are armored on the bottom and back and partially on the sides. Other aircrewmembers wear the armor carrier when needed, with both the front and back plates inserted for maximum protection.

## DEVELOPMENTAL ALSE

Research and development of more efficient ALSE is a constant ongoing process. Although modern technology has advanced current equipment, there is always room for improvement.

Research is being conducted to improve the aircrew cold weather clothing system, environmental survival kits and helicopter oxygen system. Development is also underway on such items as an integrated aircrew helmet that will be compatible with all aircraft systems, an aircraft modular survival system, airbag restraint system and an electronic personnel locator system.

Aviation research and development processes are, of necessity, methodical and time consuming, but they accomplish the desired end result—providing the best technology available.

The Army takes every precaution to ensure all of their aircraft and the aircrew personnel are properly equipped with the latest technological ALSE. The safety and survivability of Army aircraft is important, but the Army is also vitally concerned with taking care of their most important element—their pilots and aircrew personnel. These young men and women could very well be a relative or friend, and to protect them, ensure them a chance for rescue/survival in an emergency situation, it is as important to the Army as it is to you.

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*If you have a question about personal equipment or rescue/survival gear, write PEARL'S, AMC Product Management Office, ATTN: AMCPM-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798 or call AUTOVON 693-3817 or Commercial 314-263-3817.*

THE NEW COMBAT LEVER:

# SPACE

Captain James S. Marrs II

*"Give me a lever long enough, . . . and single-handed I can move the world"*

*Archimedes*

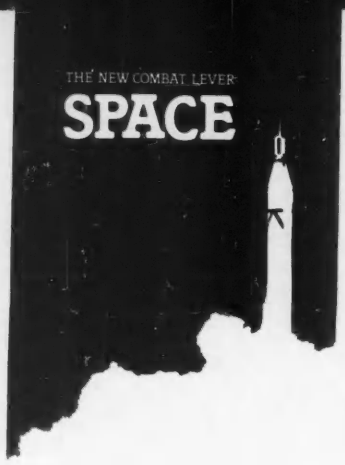
THE ARMY IS quickly discovering how effective space is—and can be—as a new lever in combat operations.

In 1986 not only was the Army Space Institute, the Training and Doctrine Command (TRADOC) space proponent, activated by the U.S. Army Space Agency, the operational Army component to the U.S. Space Command, was also organized and activated. In the 2 short years since the first Department of the Army General Officer Space Council meeting, the Army has progressed from an unfocused space concept to an organization with the personnel, expertise and mission that will focus the Army's efforts in space.

Although it seems so, space is not new to the Army. More than 35 years ago Dr. Werner VonBraun, then a civilian Army scientist, developed this nation's first intermediate range ballistic missile, the Redstone, which was successfully launched by the Army in 1952. The Redstone proved to be an early workhorse for our fledgling National space efforts. The first American satellite, Explorer I, was launched in 1958 atop an Army developed Jupiter-C booster.

Also in 1958, the first communications satellite, Project Score, developed by the Army's Signal Research and Development Laboratory, was launched along with an Air Force developed Atlas booster. Early space surveillance efforts were conducted by the Army's Ballistic Research Laboratory and the Signal Research and Development Laboratory to develop Doppler radar space surveillance systems for the integrated National space surveillance network. Additionally, Alan Shepard and Gus Grissom, America's first men into space, both rode atop a Redstone booster.

But despite all of these prestigious early Army space accomplishments, what happened? In 1958, President Dwight D. Eisenhower signed the act that created the National Aeronautics and Space Administration. To create NASA, several key Army space activities were transferred to it; the two most prominent being the Marshall Space Flight Center in Huntsville, AL, and the Jet Propulsion Laboratory at Cal Polytechnic in




California. Along with those facilities, our cadre of experienced personnel was also transferred to NASA, including Dr. VonBraun.

The next 20 years witnessed a steady decline in the Army's general understanding of space and how it could be exploited to support ground and aviation tactical commanders. True, certain elements within the Army did continue working with space and space systems, such as the U.S. Army Satellite Communications Agency or SATCOMA, but they were removed from the mainstream of the operational and tactical Army, concentrating more on strategic requirements.

Now the Army is reorienting itself to capitalize on the advantages of using space systems to support combat at the operational and tactical levels of war. To that end, the U.S. Army Space Agency's charter is: To focus and champion the space support needs of the Army in the strategic, operational and tactical arenas; provide this support for the Army in a timely manner; and, provide space user input and expertise for the Army components throughout the world.

Space operations are broken into two broad mission areas: space control and space support. What type of support is derived from space assets?

*Space control* describes the operations that allow freedom of action for our own and our Allies' space assets while denying our adversaries' assets that freedom. This includes monitoring, assessing and disseminating information on activities in space—the prerequisite for space control; as well as assuring access to space, which includes an enduring capability to get into space. Although at first glance this appears to be an exclusive Air Force mission, we in the Army must recognize its importance to ensure supporting space platforms and any future Army launched and controlled space platforms will be available for our use.

*Space support* is broadly defined as all operations that both assist the launching and platform or on-orbit control of space assets and control of the satellite payload to ensure the required support is provided to the ground tactical commanders. Space support has three functional categories: (Note: These categories are not officially recognized in Joint Chiefs of Staff Publication 1. They are used by the Army to amplify the space support mission area.)

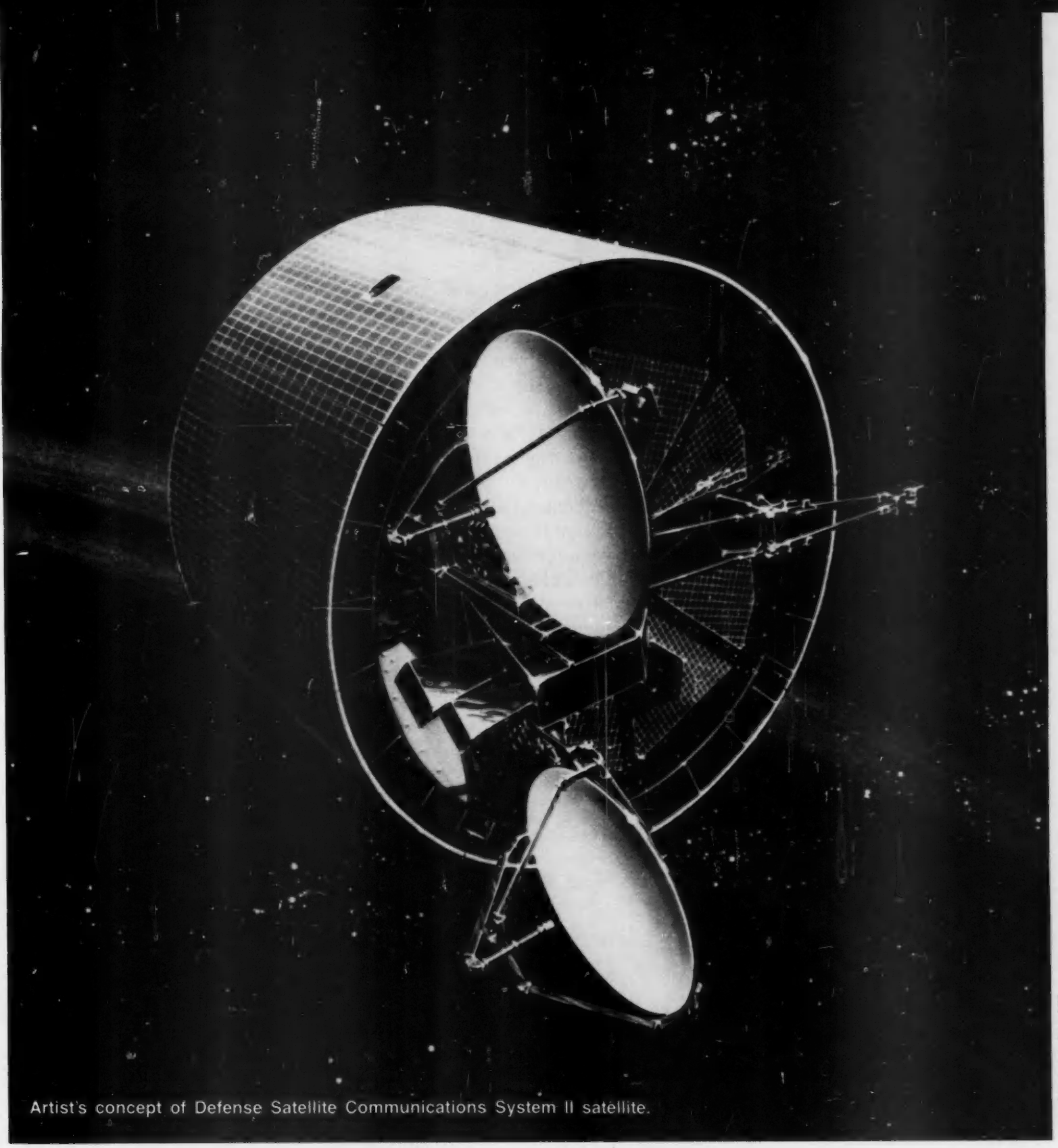
- Launch operations.
- On-orbit support (operations necessary to fly the satellite and control the payload to keep the satellite operational).
- Force enhancement.

The combat aviation commander primarily will be interested in how force enhancement can be used to provide the leverage needed to conduct AirLand Battle operations across the full spectrum of the battlefield in which he operates. The current force enhancement support available at the aviation brigade level and below is limited. However, the divisions and corps to whom we are assigned receive communications, weather and tactical exploitation of national capabilities (TENCAP) space systems support regularly.

In communications, the Defense Satellite Communications System (DSCS) program is available for use by the corps and division.

This capability dovetails nicely with a current concept evaluation program (CEP) initiative the U.S. Army Aviation Center, Ft. Rucker, AL, is sponsoring. This CEP initiative will investigate the feasibility of helicopter to ground, helicopter to helicopter, and ground to helicopter communications using a communications satellite; a capability that may be essential to overcome the line of sight communications problems we experience in maneuvering Army Aviation in the deep battle, as well as in coordinating our assets from the rear battle area to the close-in battle area. Success may justify the issue of satellite communications terminals at the aviation brigade (AB).

For meteorological support, the Air Force Air Weather Service has the primary mission to provide tactical weather observation and forecast to the division tactical operations center and rearward. To do its job, the Air Weather Service uses a variety of sources, from ground and balloon sensors to satellite systems. The Defense Meteorological Satellite Program (DMSP) is one such satellite system, as are the civilian geostationary and polar-orbiting weather satellites. DMSP directly downlinks infrared and visual photography of regional cloud cover to intheater semimobile MARK III and IV tactical terminals. DMSP also measures temperature and water vapor versus altitude, but this information is not directly downlinked to the intheater terminals. Instead, this data is downlinked and compiled at Air Force Global Weather Central at Offutt AFB, NE,



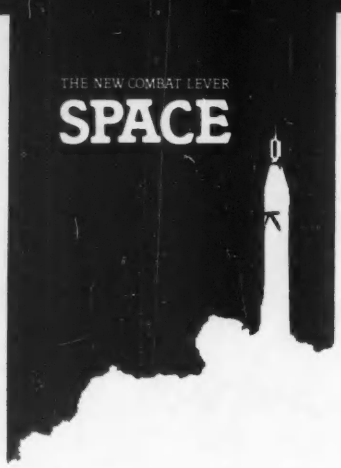
Artist's concept of Defense Satellite Communications System II satellite.

Illustration by Arthur Hill

and at the Navy's Fleet Numerical Oceanography Center (the Navy's meteorological and oceanographic organization). It is then passed along to the Air Force Staff Weather Officers (SWOs) supporting the Army.

This arrangement is neither timely nor complete. DMSP does not provide observations of all the weather parameters the Army requires. The combat aviation commander may have a good picture of the weather in his brigade assembly area but not a very accurate outlook of what is in front of him. An organizational and operational plan for an Army sponsored environmental support satellite is in draft at the Army Space Institute. Although still in the conceptual definition phase, this system is expected to be a constellation of geostationary satellites that will provide the tactical aviation commander on-demand weather support.

Information from the TENCAP program is available today directly to the corps headquarters. This information is fed into a computer based corps system where it is



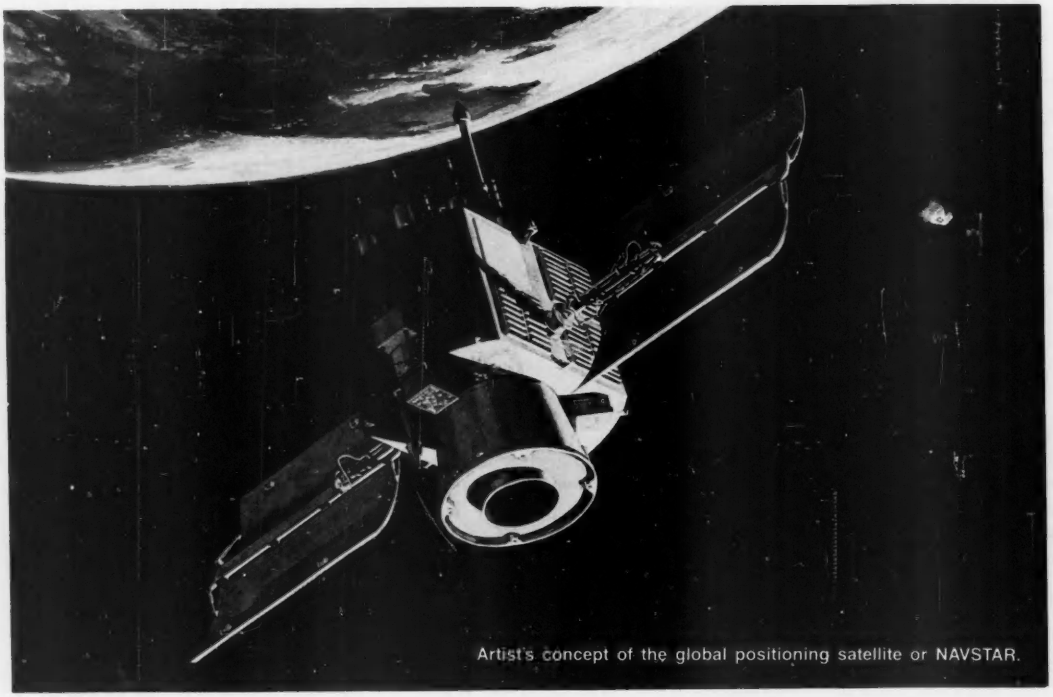

fused with other information sources and passed to the corps AB and assigned divisions' multisource information centers. This all-source information is available today to the division AB through our S2 channels.

It is apparent from what I have described that even today considerable combat leverage is being applied from space and the future looks even more promising. The Army Space Agency will continue to aggressively work to provide the Army tactical ground and aviation commander effective and timely space system support.

The Army Space Agency also will be taking a proactive role in on-orbit control of any future organic Army satellites as well as other supporting systems. Additionally, the Agency will be investigating intheater launch scenarios to provide rapid response to tactical support requirements.

For force enhancement support, the Department of Defense will begin deployment of improved systems in the 1990s. Highlights of these are:

- Communications will be improved with the deployment of Milstar, the next generation communications satellite. Milstar will provide jam resistant, secure communications and have greater capacity than today's systems. Additionally, ground terminals will be shrinking in size and increasing in numbers to give satellite communications capability to wider numbers of tactical users.
- TENCAP will be improved with the ability to access and fuze more information from existing national systems as well as from the evolutionary improvements to those systems.
- Meteorological support will improve with the deployment of the Army Environmental Support System, the follow-on DMSP Block 6 system, and the proposed manportable tactical terminals to process all meteorological satellite data. This will undoubtedly enhance the ability of the Air Force SWOs to provide our aviation units



Artist's concept of the global positioning satellite or NAVSTAR.

the weather support they require.

- Ability to navigate will be considerably improved with the deployment of the global positioning system or NAVSTAR (see page 36) and with the installation of the associated receivers in our aircraft. The combat aviation commander as well as the aviator will be able to conduct operations with three-dimensional position accuracy to 15 meters, velocity accuracy to .1 meters/second and timing accuracies to .1 microseconds.
- Geodetic information available from Landsat (earth resources satellite) and similar future systems will provide topographical, geographical, geological and hydrological multispectral imagery data for the terrain analysis section at corps. Working with a timely and accurate data base will enhance that section's ability to provide more accurate maps and more timely terrain analysis products for use in operations.


## ABOUT THE AUTHOR

**CPT James S. Marrs II is currently a space operations officer in the Operations Division of the U.S. Army Space Agency. He participated on the Vice Chief of Staff of the Army directed Army Space Initiative Study before his assignment to the Army Space Agency. He is a rated AH-1 Cobra aviator with experience in the 6th Cavalry Brigade at Ft. Hood, TX. CPT Marrs is a graduate of the Armor Advance Course and the Combined Arms Service Staff School.**


In addition to materiel and equipment improvements, the U.S. Army Space Agency in collaboration with the Army Space Institute will pursue new organizational, personnel and training initiatives. These actions will mature the Agency into a command and increase the corporate space consciousness of the Army, giving the Army the space expertise required to be totally proficient in space operations. Briefly, these initiatives are:

- Operational control of DSCS payload functions through the DSCS operations centers on behalf of the commander in chief of the U.S. Space Command (USCINSPACE). DSCS operations centers provide payload control for the satellite as well as perform the tracking, telemetry and command functions necessary to keep the spacecraft on-orbit and functioning properly.
- Control of the space surveillance radars at Kwajalein Missile Range in the South Pacific. These are contributing sensors for the national space surveillance network, whose operation is the responsibility of U.S. Space Command.
- Assignment of eight Army officers to Falcon Air Force Station, CO, to work with the Air Force in satellite control operations.
- Expand the Army's presence within NASA's organization to increase the Army's experience in manned space flight operations.
- Monitor Military Personnel Center's (MILPERCEN's) selection and the use of the Army personnel at the Naval Postgraduate School matriculating in the space operations and space engineering curricula and in other programs at the Air Force Institute of Technology and at civilian universities.
- Send selected Army personnel to the Air Force's Undergraduate Space Training Course.
- Monitor actions by the Army Space Institute and MILPERCEN to develop a comprehensive career progression and management plan for the Army space officers with additional skill code identifier 3Y. Presently there are 487 3Y personnel for 511 positions Armywide.
- Initiate support of TRADOC initiatives to add a space operations officer to the S3/G3 sections at division and corps.

These initiatives, and the activation of the U.S. Army Space Agency, will give the Army the expert and positive voice needed to conduct effective space operations in support of the tactical ground and aviation commanders.

The Army was "first in space" and is now making the investment to capitalize on this useful and capable combat lever.

U.S. ARMY SAFETY CENTER

# WIRE PROTECTION: A STEP FORWARD

**CW4 Robert J. Rendzio**

*The opinions expressed in this article are those of the author and are not necessarily those of the Department of the Army or the U.S. Army Safety Center.*

How effective is the present wire strike protection system? Is the system sufficient, or can it be improved? The answers to these and other questions about wire protection are addressed in this, the third article in a four-part series on wire hazards. The final article on wire detectors will appear in the next issue.

IN THE NOVEMBER issue of *Aviation Digest* we discussed the frailty of human beings, pilots in particular.

That frailty becomes all too apparent when we depend on visual cues to avoid obstacles such as wires. Because we understand that people are fallible, we supplement our human abilities with mechanical or electrical aids. One such aid that has served us well is the wire strike protection system (WSPS) or, as it is commonly referred to, wire cutters.

The sole purpose of the WSPS is to increase our chances of survival when our human senses have failed to detect wires and a strike cannot be avoided. The cost of the WSPS is modest and its rewards are great. But just how well does the WSPS work, and is it the final solution to wire damage avoidance? As you shall see, while it has helped, and is cost-effective, the installation of wire cutters, although undeniably important, is a step in the ongoing process to bring us closer to that final answer.

Wire strike protection systems are designed to cut ⅜-inch diameter wires, with 11,500 pounds per square inch (psi) tensile strength, at angles of 30 degrees. Additionally, the system's capability increases as the relative engagement angle increases toward the perpendicular, and effectiveness will vary in relation to airspeed. However, most of the wires we are hitting exceed 15,000 psi in tensile strength, and wires exceeding 20,000 psi are nearer the norm.

Examples are the 7/16-inch extra-high-strength steel static lines atop transmission towers. These wires have a tensile strength of more than 21,000 psi and, contrary to popular belief, statistics show that power lines cause the majority of our damaging strikes. As a matter of fact, there was not a single reported instance from 1981 through 1985 of damage from commo wire (WD1), TOW wire or kite string. The effect of such encounters was an interruption of the flight to remove the windings.

For the purpose of this study, 103[1] wire strikes occurring from 1981 through 1985 were analyzed.

Before we go any further, we should clarify use of the terms "multiple" and "single" wire engagements. These terms refer solely to the number of the wires

1. The total was 117. However, 14 were not evaluated because they occurred at a hover, had insufficient data, or were found during the postflight inspection.

that were struck. For example, if a helicopter strikes one of four wires of a transmission circuit (power line), the incident would be a single-wire engagement. Let's look at the significance of these wires and their effect on our aircraft.

One wire, no matter how large, is easier to break than multiple wires of the same type. This is due in part to the sheer momentum of the aircraft that is concentrated on one wire. In multiple wire engagements, this force becomes widely distributed, making the wires harder to break.

Another factor is the striking point of the aircraft. The saddle mounts on the crosstubes of a UH-1 offer an exceptionally solid point. As a result, when struck on the crosstubes an aircraft would have a greater possibility of breaking the wire. On the other hand, wire engagement into the control tubes can be disastrous. This is true because as the control tubes rotate, they tend to bend, distort and become lathed by the wire. As a result, control tube failure can occur even if the wire is of low tensile strength.

Multiple-wire engagements are special problems because each wire contact point is generally different, and while one wire may strike the crosstube area, another wire may strike the swashplate, and a third, the control tubes. Given that the wires are of the same strength, the aircraft's momentum is depleted by the number of wires struck and control is eventually lost.

**What kinds of wires are we hitting?**

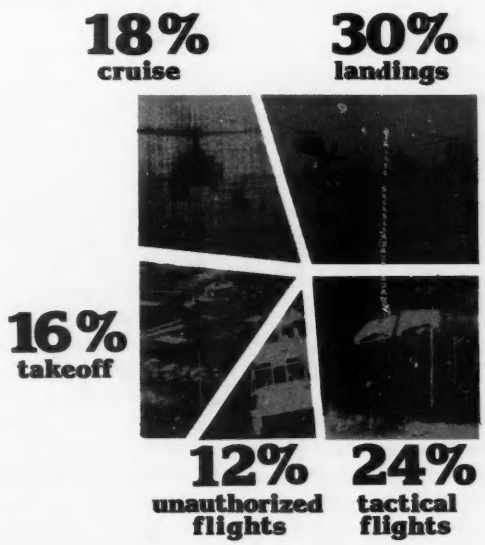
The number-one nemesis when it comes to wire strikes is power lines. Power lines and bracing wires account for more than 60 percent of all wire strikes. The most frequently struck wire had a diameter of ⅜- to ½-inch with tensile strength generally in excess of 15,000 pounds.[2] In fact, this size wire was struck in 60 percent of all cases.

**Where do wire strikes occur?**

Landings and approaches account for 30 percent of the wire strikes; followed by cruise operations at 18 percent; takeoffs at 15 percent; unauthorized cruise flight at 12 percent; and, tactical operations at 24 percent (figure 1). Kite strings, TOW wire and commo wire accounted for about 11 percent of the total strikes, but as previously stated, no damage resulted from these strikes.

Conclusions are difficult to draw from these last figures, but one can readily understand that takeoff and landing operations (almost half) represent one of the busiest times for an aviator. During this phase of flight, an aviator's attention is intensely focused on the mechanics of flying the aircraft. Conversely, during nap-of-the-earth operations, we tend to keep our eyes open to impending hazards and generally our flight is well-coordinated both with other crewmembers and

2. Based on 2397-6R data available in 41 cases.



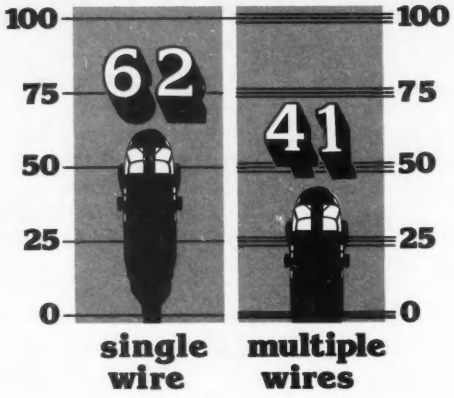



FIGURE 2: Single versus multiple wire strikes.

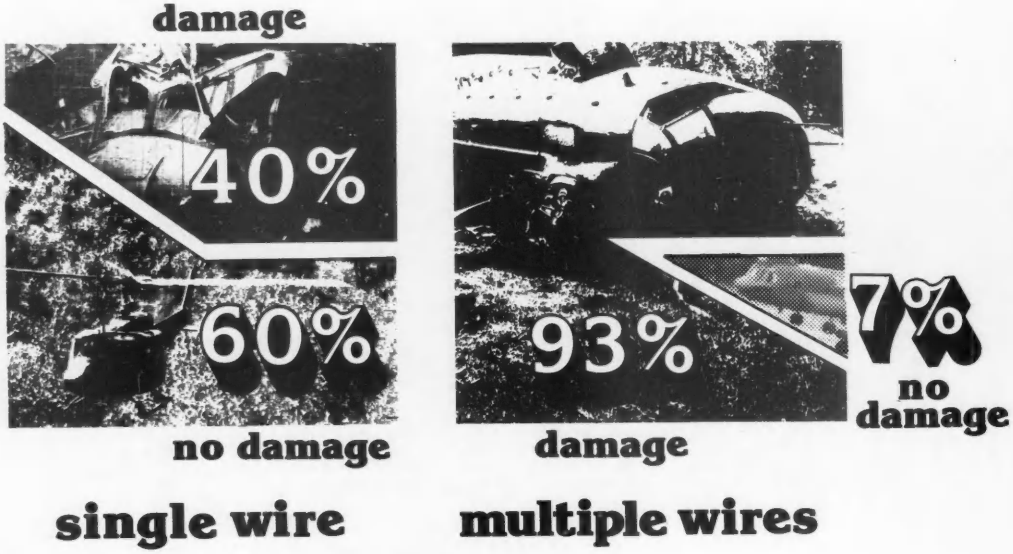



FIGURE 3: Damage incurred in single versus multiple wire strikes.

with our maps. In fact, in many places the hazards have been committed to memory.

**Effects of human frailty**

Among the considerations in what causes wire strikes are our own physical limitations, which can preclude us from seeing what is actually there; or, it can alter what we see to the point that *what we perceive* is misinformation. That was pointed out in the article entitled "Human Frailty," in the November issue of *Aviation Digest*. Human frailty is one reason wire cutters have been installed in Army aircraft. They are intended to cut wires we might fail to see before contact with them can cause damage. Just how well are WSPSs working to prevent damage? To accurately answer that question, we should first look at wire strikes in general.

Of the 103 wire strikes studied, 62 involved single wires and 41 involved multiple wires (figure 2). We find that of the 62 single wires encountered, only 40 percent of them (26) resulted in damage, with an average cost of $130,000 per event (figure 3). Con-

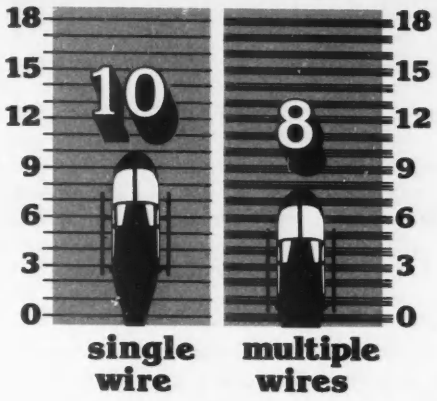



FIGURE 4: Percentage of single and multiple wire strikes by OH-58 aircraft.

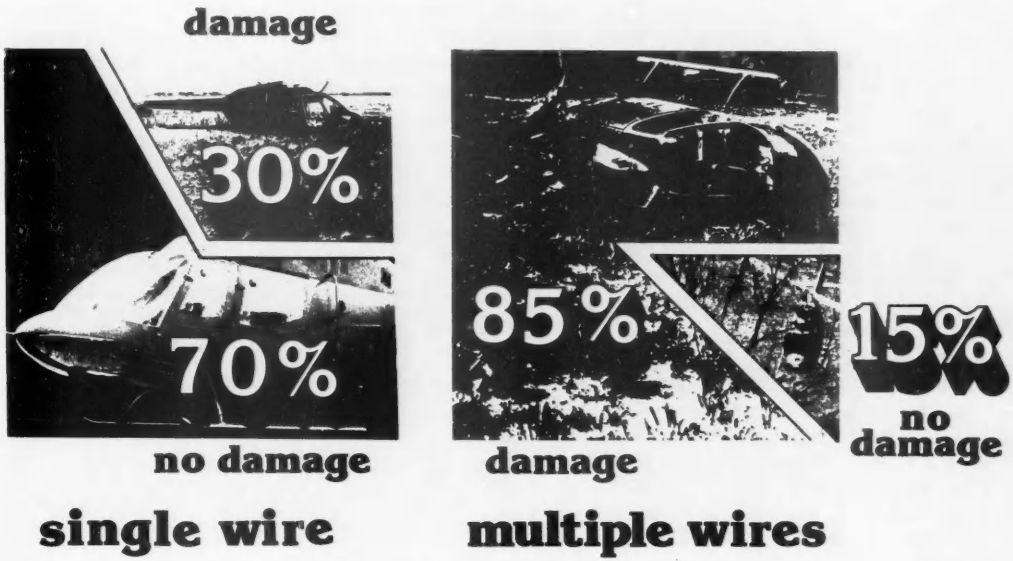



FIGURE 5: Percentage of damage resulting from single and multiple wire strikes in OH-58 aircraft.

versely, encounters with multiple wires resulted in damage in more than 90 percent (38) of the engagements, for an average cost of $316,000[3] per event, or almost 2.5 times the rate of single-wire strike costs. In addition, multiple-wire strikes accounted for in excess of 90 percent of all fatalities.

To see how much we've improved with aircraft equipped with a WSPS, let's look at the OH-58 Kiowa.[4] Since 1983, OH-58s equipped with a WSPS have been involved in 18 wire strikes. Of these, 10 were single-wire and 8 were multiple-wire engagements (figure 4). Of the single-wire strikes, only 30 percent resulted in damage, which averaged $33,000 per incident, whereas 85 percent of the multiple-wire strikes resulted in damage (figure 5). However, it's important to note that in one incident, aircraft control was lost by the pilot rather than being disrupted by the

3. It should be understood that average costs cited here are based on only those aircraft sustaining damage. If we included all aircraft involved, those that had wire strikes but did not sustain damage, damage costs per event would be $54,000 for single-wire strikes and $292,000 for multiple-wire strikes.
4. Review of other aircraft involved with wire strikes indicates data consistent with the OH-58 information (based on 2397-6R data).

wire strike itself. If this incident were eliminated, the single-wire incident cost would drop to less than $15,000 per event. When we compare the WSPS-equipped OH-58 wire strikes to all wire strikes, we find that the OH-58 equipped with a WSPS hits single wires with about the same percentages (55 versus 60 percent) and the damage assessment is also about equal (30 versus 40 percent). Single-wire strikes in general, with or without a WSPS installed, do not manifest themselves as a major problem. However, multiple wire strikes are a different story.

OH-58s equipped with WSPS accounted for 8 multiple-wire strikes; 45 percent of all wire strike engagements. As with other aircraft involved in multiple-wire strikes, the OH-58 fared poorly. In about 85 percent of its engagements with multiple wires, the OH-58 equipped with a WSPS sustained damage of about $131,000 per event.[5]

Multiple wires, which caused the greatest amount of damage to aircraft not equipped with WSPS (90 percent) also caused the most damage to the OH-58 equipped with WSPS (85 percent). This, of course, is due to the multiplicity of the wires. An aircraft has little difficulty in negotiating one wire; however, when a second and third wire must also be neutralized, the situation becomes extremely difficult. If by chance, all the wires are captured by the WSPS, then of course they are cut and no damage is incurred. However, the WSPS can only be expected to protect a system-designed percentage of the aircraft's frontal area. Thus, if one wire is missed, and its strength is sufficient to disrupt aircraft control, then damage and/or injury are imminent.

So, what have we learned from all of this? First, the single wire isn't the real threat. We can negotiate single wires far easier than we can multiple wires (with or without a WSPS); our chances of success are great (90 percent). Where multiple wires erode the potential for aircraft survivability, single-wire engagements cause less disruption overall.

Second, a multiple set of wires has generally the same effect on aircraft with or without a WSPS installed. At the very least, the mission is disrupted. In more than 85 percent of all multiple-wire engagements studied, there was damage regardless of whether or not a WSPS was installed.

In addition, TOW, commo wire, kite string and other small-gauge wires are not threats to aircraft. In the cases studied, they did not account for one instance of damage. It is the larger ⅜- to ½-inch power line wires that pose the greatest danger.

While our wire protection systems are effective they simply can't provide 100 percent coverage of an aircraft's frontal area that may be exposed to multiple wires. The WSPS, due to its low cost and its effectiveness when wires are captured, will always be an essential and prudent requirement on rotary wing aircraft. But, when all requirements are considered, what we still need protection from are the power lines and the larger diameter, high-tensile-strength multiple wires.[6]

So, where do we go from here?

More than 10 years ago, wire detection systems capable of detecting wires were under development. However, due to cost and weight, these systems were bypassed temporarily in favor of the current lightweight system that cuts wires as they are encountered. Obviously, however, WSPS, in concert with wire detection systems, might prove to be the final solution to avoiding wires and preventing damage, injury or fatality. With the acquisition of new and more costly equipment, along with the costs associated with human losses, supplementary devices that work with the WSPS must be explored. Our final article in this series addresses such a device—wire detectors.

5. It is coincidence that this figure is approximate to the average single-wire engagement cost for all aircraft. In addition, the reader is cautioned not to compare figures (actual dollar amounts) between the OH-58 and those figures representing *all* aircraft, as those figures also include higher-cost equipment.
6. Tensile strength is actually the governing factor. However, generally speaking, high tensile strength and large diameter go hand in hand.


**ABOUT THE AUTHOR**

**CW4 Robert J. Rendzio is a safety officer assigned to the 3d MI Battalion in Korea. He has been involved with aviation safety for more than 10 years, serving in that capacity at various levels within the Army. At the time this article was written, CW4 Rendzio was assigned as an investigator with the U.S. Army Safety Center.**

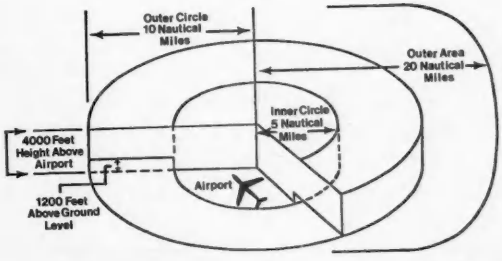
# ARSA—Airport Radar Service Area

**CW4 Lawrence K. Hanna**
U.S. Army Air Traffic Control Activity
Aeronautical Services Office
Cameron Station, Alexandria, VA

HOW MANY TIMES have you been on an instrument flight rules (IFR) flight plan and just prior to arriving at your destination, cancelled IFR and continued visual flight rules (VFR) to land? Did you put away your IFR en route chart and pull out your sectional? You say, "Why do I need a sectional when the airfield is just around the corner and I can still navigate with my en route chart?"

Yes, you can navigate with your en route chart, but what about the airport traffic area or the new airport radar service area (ARSA) that you may have to fly to, or through, to get to your destination? This airspace information is not found on the IFR en route charts and if you penetrate this airspace without making radio contact with the controlling agency, you have violated the Federal Aviation Regulations.

**Airport Radar Service Area**




The National Airspace Review Task Group's review of airspace use and procedural applications of the air traffic control (ATC) system was conducted by the Federal Aviation Administration (FAA) with the main objective of improving the ATC system by increasing safety and efficiency, and by reducing the complexities of terminal radar service areas (TRSAs). In reviewing terminal airspace, it was concluded that TRSAs should be replaced by ARSAs.

Additionally, the task group recommended that the FAA develop quantitive criteria for proposing to establish ARSAs at locations other than those that are currently in the TRSA replacement program. As of September 1987, there were 89 ARSAs with new ones being established periodically. The new ARSAs are then published in the Class II NOTAM book until the next charting cycle is completed.

ARSAs are shown on sectional charts and some terminal area charts by a dashed blue line and normally are comprised of the airspace within a 5 and a 10 nautical mile circle centered on the primary airport. Each sector altitude is identified in solid blue color, by MSL ceiling and floor values of the respective sector.

Additional information may be found in chapter 3 of AP/1, the Airman's Information Manual or in the Class II NOTAMs.

The quiz on the following page pertaining to the Birmingham, AL, ARSA is written to enhance your

awareness and knowledge of this most recent form of controlled airspace. Take a few minutes to test yourself on the rules and procedures. Answers are found on page 45. Questions or comments concerning this information should be directed to CW4 Lawrence K. Hanna, AUTOVON 284-7773/7774.

# ARSA Quiz

1. The ARSA airspace consists of two circles, with the inner circle having a radius of _____ and extending from the surface of the ARSA airport up to _____ above that airport.
   a. 5 SM, 4,000 feet AGL
   b. 5 NM, 4,600 feet AGL
   c. 5 NM, 4,000 feet MSL
   d. 5 NM, 4,000 feet AGL

2. The airspace between the 5 NM and 10 NM rings begins at:
   a. The surface up to an altitude of 4,000 feet AGL
   b. 700 feet AGL up to 4,000 feet AGL
   c. 1,200 feet AGL up to 4,000 feet AGL
   d. 1,200 feet AGL up to 4,600 feet AGL

3. Military pilots flying VFR at 3,500 feet within the ARSA must have:
   a. Two-way radio communications with ATC
   b. A transponder with MODE 3/A 4096 capability
   c. No equipment requirement for military
   d. Both a and b

4. VFR flights operating within the ARSA:
   a. Must maintain two-way radio communications with ATC
   b. Are provided traffic advisories and conflict resolution with IFR aircraft
   c. Are provided traffic advisories and safety alerts between VFR aircraft
   d. All the above

5. The normal outer area limits of this ARSA extend for _____ miles.
   a. 10 statute
   b. 5 statute
   c. 10 nautical
   d. 20 nautical

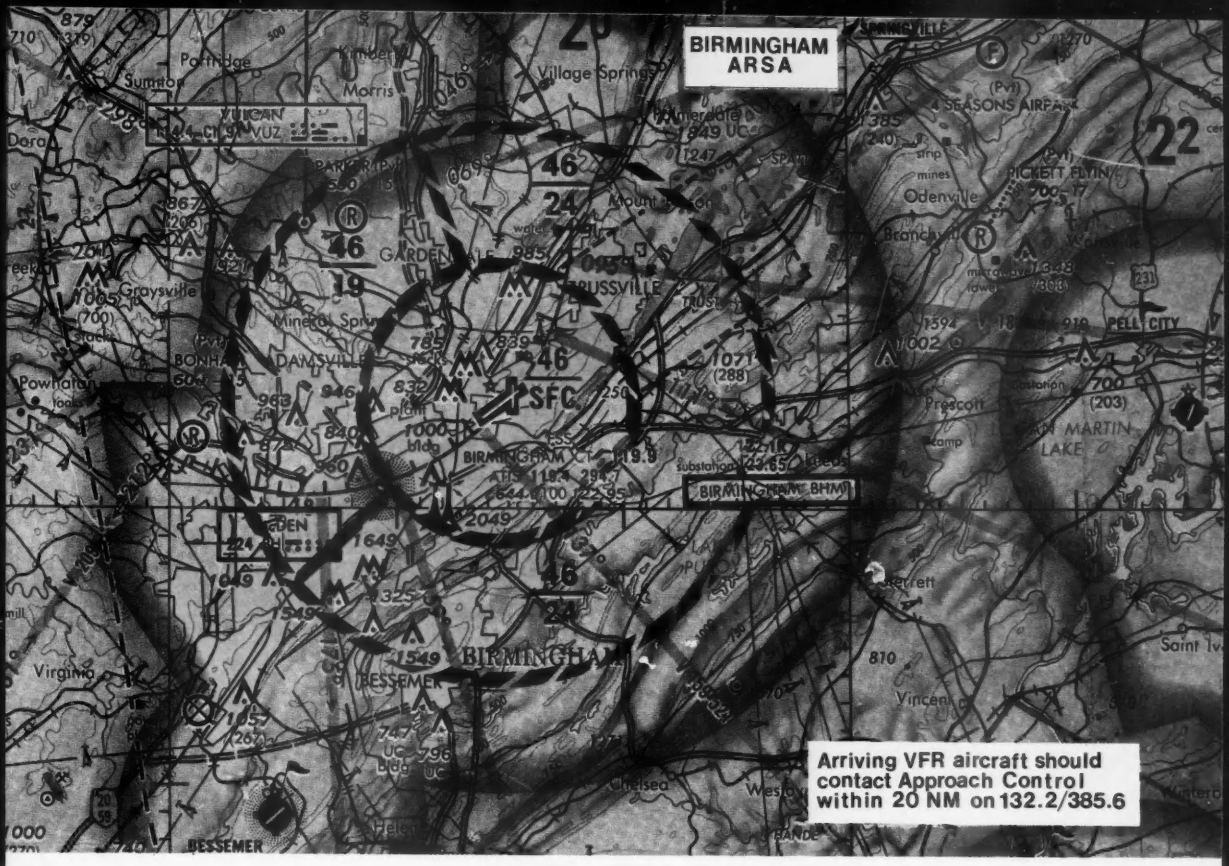
6. The depicted ceiling of the Birmingham ARSA is:
   a. 4,000 feet MSL
   b. No ceiling
   c. 4,600 feet AGL
   d. 4,600 feet MSL

7. Arriving from the southeast, VFR aircraft should contact _____ within _____ of Birmingham Muni on VHF/UHF frequency _____.
   a. Birmingham App Control, 10 NM, 132.2/385.6
   b. Birmingham App Control, 20 NM, 132.2/385.6
   c. Birmingham Unicom, 20 NM, 122.95
   d. Birmingham Twr, 20 NM, 119.9

8. Some ARSA facilities shut down for portions of the night. When this occurs, the effective hours of the ARSA will be the same as the operating hours of the serving facility.
   a. True
   b. False

9. You are flying toward the ARSA from the east and will penetrate the outer ring. You must be below an altitude of _____ to remain clear of the ARSA.
   a. 4,600 feet MSL
   b. 4,600 feet AGL
   c. 2,400 feet MSL
   d. 2,400 feet AGL

10. Approaching from the west you may descend and land at Parker Airfield without communicating with ATC in any way.
    a. True
    b. False




ANSWERS TO ARSA QUIZ

1.d. The Birmingham ARSA airspace consists of two circles, both centered on Birmingham Muni. The inner circle has a radius of 5 NM and extends from the surface of the ARSA airport up to 4,000 feet above that airport.

2.c. The airspace area between the 5 NM and 10 NM rings begins at a height of 1,200 feet AGL and extends to the same altitude cap as the inner circle, which is 4,000 feet AGL.

3.a. The only requirement that a military pilot has, to fly within the ARSA, is two-way radio communication with ATC.

4.d.

5.d. The normal radius will be 20 NM, with some variations based on site specific requirements.

6.d. 4,600 feet MSL. All ARSA elevations depicted on sectional charts are MSL values.

7.b. Check the appropriate blue rectangular box depicted to the southeast for instructions.

8.a. True.

9.c. 2,400 feet MSL. The eastern floor of the Birmingham ARSA begins at 2,400 feet MSL.

10.a. It is possible to land at Parker Airfield without communicating with anyone, but the thrust of ARSAs is to prevent midair collisions. To sacrifice the assistance of radar for the sake of not making a radio call appears foolhardy.

*Readers are encouraged to address matters concerning air traffic control to: Director, U.S. Army Aeronautical Services Office, Cameron Station, Alexandria, VA 22304-5050.*

# RSI Report

Mr. Rush Wicker

CALTRO TYRO has recently become a common term among the American, British, Canadian and Australian (ABCA) nations.

In November 1987, a brigade staff from each allied nation arrived at Ft. Ord, CA, to participate in a multination command post exercise (CPX). During the past 8 months, two planning meetings have been hosted by the 7th Infantry Division. Staff officers from each nation have met around the table to resolve differences that may exist in operational procedures and support requirements.

Surprisingly, only minor problems have been uncovered, and even more significant is the fact that Winston Churchill's philosophy that the English speaking nations are held together with a common language that no one can understand has not proven to be a problem. In fact, the exchange of ideas between the British and the Australians has proven quite entertaining as well as informative.

The origin of the ABCA Program goes back to the close cooperation among the Allies during World War II. After the war, a decision was made that this close cooperation should continue, and by 1947, a "Plan to Effect Standardization" had been initiated among the armies of the United States, Britain and Canada—the ABC Armies. The Plan to Effect Standardization was replaced by a "Basic Standardization Concept" in 1954.

In 1964, after Australia joined the organization, the current Basic Standardization Agreement (BSA 1964) was ratified by the armies of the United States, United Kingdom, Canada and Australia, and the ABCA Program was formally established. By invitation of the ABCA Armies, New Zealand became associated with the program, through Australia, in 1965. The aims of this agreement are:

- To ensure the fullest cooperation and collaboration among the ABCA Armies.
- To achieve the highest possible degree of interoperability among the signatory armies through materiel and nonmateriel standardization.
- To obtain the greatest possible economy by use of combined resources and effort.

Within the organization are Quadripartite Working Groups (QWGs). There are a total of 19 QWGs of which one is aviation. The mission objective of each QWG is to achieve the highest possible degree of interoperability through materiel and nonmateriel standardization. In general, their tasks are to:

- Exchange information.
- Develop concepts.
- Influence requirements.
- Properly identify areas for cooperation and standardization.
- Develop standardization agreements.
- Participate in the validation of standardization agreements.
- Maintain the standardization level that has already been achieved.

During the initial planning for the November 1987 CPX, the planners recognized an additional benefit to be gained and proposed that the exercise also be used to validate approved Quardripartite Standardization Agreements (QSTAGs). These documents are agreements made among the nations concerning operational procedures and technical requirements.

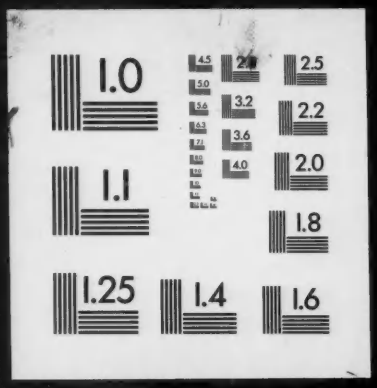
About 40 QSTAGs were approved for validation. Eight validation teams, two from each nation, were formed and participated in the exercise. Members from each team observed the operation of each brigade staff to determine if the terms of the QSTAGs have been incorporated into the operational procedures of each nation. The degree to which the force interoperated reflected the progress achieved. When a stumbling block occurred, the problem was identified for the development of new standardization. The bottom line was to determine what progress had been made and to discover weaknesses.

The end of CALTRO TYRO will not conclude the ABCA's plan to develop and evaluate the forces' capability to interoperate. CALTRO FORCE will soon become a common term among the ABCA nations. In March 1989, a combat battalion from each nation will participate in a 10-day field training exercise. The goal of this exercise will be similar to the CPX but having troops in the field will permit a more realistic assessment of the force's capability to interoperate.

The motto of the ABCA Program, "Show the Way," is truly a living testimony of the organization's goal to attain a more effective combat force.

If this article has generated any questions or requirements, please contact Mr. Rush Wicker by writing: Commander, U.S. Army Aviation Center, ATTN: ATZQ-D-CC, Ft. Rucker, AL 36362.

AMERICAN, BRITISH, CANADIAN AND AUSTRALIAN ARMIES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